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ABSTRACT

This consumer guide presents updated information on many of the systems and software programs that are currently available to and used by vocational evaluators. Software included in the book was selected through contacting all known developers for information and product samples for review. The guide is organized in four sections. The first section profiles 18 vocational evaluation systems; each description includes the following: precis, a description, information on administration of the software, information on scoring, interpreting and reporting results, measurement data, and a summary and review. The second section profiles 12 job search computer programs. Software descriptions include the following: precis and information on development, comprehensiveness and use, utility, user friendliness, documentation, hardware, and cost. The third section of the guide presents a summary of the results of a user satisfaction survey of systems and software, with ratings and comments about software programs' strengths, weaknesses, and recommended changes. The final section lists 20 questions that consumers may use to evaluate software for potential purchase. The guide includes a list of 29 references and a glossary of 38 terms used in vocational evaluation, with extensive definitions. (KC)

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Vocational Evaluation Systems and Software:
A Consumer's Guide

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Randall McDaniel
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and
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Vocational Evaluation Systems and Software:

A
Consumer's Guide

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Foreword

This consumer guide presents updated information on many of the systems and software programs that are currently available to and used by vocational evaluators. While similarities exist, each system or program has its own unique features, which apparently reflect the beliefs that the developers maintain toward the vocational evaluation process. Inspection of the material contained in this guide, however, reveals that the technological base for the discipline of vocational evaluation was derived from three primary sources; namely, psychometric tests, work samples, and labor market information. Each source has had an important impact on the development of vocational evaluation technology and on the evolution of our discipline.

Psychometric tests have been used for vocational assessment purposes since the early 1900s--well before the discipline of vocational evaluation came into being. And, psychometric principles are applied to different degrees in all of the vocational evaluation systems discussed in this guide. Furthermore, many of the systems directly incorporate various psychometric tests (which were developed independently for specific purposes) into their format. Although not confined to our discipline, such tests and principles are extensively applied by vocational evaluators and remain an essential component of vocational evaluation's technology.

As a unique and separate discipline, however, the field of vocational evaluation owes its existence to the work undertaken at The Institute for the Crippled and Disabled during the 1930s and its subsequent publication of the TOWER (Testing, Orientation, and Work Evaluation in Rehabilitation) system in 1957. The series of work samples contained in the TOWER system provided a new and refreshing approach to assessing the work-related abilities of people with disabilities, an approach that confronted individuals with their own abilities and limitations as they performed job-related tasks by using the tools and materials commonly encountered on the job or in the work setting. The TOWER System's work samples established the technological foundation for many of the vocational evaluation systems that were subsequently developed and are discussed in this guide.

In order to evaluate people for work, their performance on psychometric tests and work samples must be compared against the requirements and demands of occupations that exist in our society. Since the Dictionary of Occupational Titles (DOT) contains the most complete and comprehensive description of occupational requirements and demands in the United States, that publication has become the primary source of labor market information for vocational evaluation programs. Originally published in 1939 and substantially revised in 1949, 1965, 1977, and 1991, the DOT continues to present updated information which identifies, defines, and classifies most of the jobs that exist in our labor market. Because of its comprehensive nature, the DOT has served as the primary reference for the various vocational evaluation systems covered in this guide.

A companion volume to the Second Edition (1949) of the DOT, known as the Estimates of Worker Trait Requirements for 4,000 Jobs, was published in 1957. As its title implies, that publication provided estimates of the type and/or degree to which various factors or traits (i.e., General Education Development (GED), Specific Vocational Preparation (SVP), Physical Demands, Working Conditions, Aptitudes, Temperaments, and Interests) were deemed essential to the performance of 4,000 selected DOT-defined jobs. These factors were incorporated into the Qualifications Profile within the Worker Trait Arrangement section of the Third Edition (1965) of the DOT. And, shortly after the publication of the Fourth Edition (1977) of the DOT, these same traits were presented for each DOT-defined job in a companion volume, known as the Classification of Jobs (COJ). Both the Fourth Edition of the DOT and the COJ were recently revised, and the revised version of the COJ presents expanded and more detailed information on the Physical Demands and Environmental Conditions factors. These two publications (the DOT and the COJ) provide the technological basis for each of the software programs contained in this consumer guide.

This brief historical discussion was undertaken to show that the technology presently available to vocational evaluators was orderly in its development and based on procedures or knowledge that underlie our discipline. Systematic work on these procedures began in the 1930s, continued throughout the 1940s, and culminated in 1957 with the publication of the TOWER system and the Estimates of Worker Trait Requirements for 4,000 Jobs. Thus, 1957 might be viewed as the inception year for our discipline's technology since most of vocational evaluation's current systems and software programs were derived from materials published during that year.

Although many changes have occurred in vocational evaluation since 1957, including the development of a fairly extensive technology, the discipline and its technology is firmly based on the application of psychometric tests, work samples, and labor market information. Consequently, vocational evaluators should have a working knowledge of these three discipline-based procedures, and should then select and apply those systems and/or software programs that enable the clients served to gain maximum benefit from their involvement in the vocational evaluation process. By matching the needs of the clients typically served in a specific vocational evaluation program with the information presented in this consumer guide, vocational evaluators should be able to select the technology that will most effectively enable them to accomplish their program goals.

Julian M. Nadolsky

Dr. Julian Nadolsky is President of the Rehabilitation and Wellness Center in Knoxville, Tennessee. He completed his undergraduate and master's work at the Pennsylvania State University and his doctorate in Counselor Education at Auburn University. For nearly two decades he served on the Rehabilitation Education faculties at Auburn University and the University of Tennessee. His first book, Development of a Model for Vocational Evaluation of the Disadvantaged (1971), is considered a pioneer work in the field. He was the second editor of the VEWAA Bulletin and contributed some 30 articles and editorials to the Bulletin. Dr. Nadolsky is also a past editor of the Journal of Rehabilitation.

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Introduction

Vocational Evaluation Systems and Software: A Consumer's Guide is basically a combined and updated continuation of the fine work of Dr. Karl Botterbusch who authored five editions of Vocational Assessment and Evaluation Systems: A Comparison (1976, 1977, 1980, 1982, 1987) and A Comparison of Computerized Job Matching Systems (1983, 1986). The authors borrowed freely from the work of Dr. Botterbusch and certainly want to acknowledge his contributions to this book. The purpose of this volume is the same as that expressed earlier by Botterbusch--helping consumers of assessment systems and software make informed decisions about products which are most appropriate for vocational assessment/evaluation of their special populations.

In selecting assessment systems and software for inclusion in this volume, an attempt was made to contact all known developers for information and product samples for review. Developers were also offered the opportunity to see the reviews and suggest corrections of any factual errors. Therefore, the resulting reviews included herein are based on the responses received and the information provided by the developer. We apologize for any omissions due to our inability to contact all product developers.

Over the years coauthors Drs. McDaniel, Couch, and Mr. McClanahan have consulted in the development and marketing of certain assessment systems and software. At the time of writing, none of the authors were consulting with any product developer.

The standard format chosen for review of each assessment system begins with an abbreviated summary of the system--the Precis, which is followed by: I. A Description; II. Administration Procedures; III. Scoring, Interpreting, and Reporting; IV. Measurement Properties; and finally, V. A Summary and Review. A glossary has been included in the Appendix to facilitate understanding of any unfamiliar terms.

The authors believe strongly that when embarking on an assessment/vocational evaluation program, the first priority is to secure the services of a well-trained and experienced vocational evaluator, preferably one who is certified by the Commission on Certification of Work Adjustment and Vocational Evaluation Specialists (CCWAVES). No product or system has yet been devised to replace a professional evaluator who is trained to gather evaluation data by studying the case history, observing client behaviors, testing, guiding and interacting with the individual being evaluated. This professional is subsequently responsible for analyzing and synthesizing evaluation data from all sources. After discussion with the client, the evaluator then makes clinical judgements and recommendations which may impact on the individual's life direction. Assessment/vocational evaluation systems and job search software therefore are seen here as helpful tools and work aids which can assist the professional evaluator and the consumer in the total evaluation process.

Nonetheless, vocational evaluation systems and software can prove enormously helpful as tools and work aids in assessing individuals with special needs. They help structure a more comprehensive search for an appropriate vocational direction, help in the possible transference of skills from a previous job to new jobs, and speed up the assessment/evaluation process. An increasing amount of research on the reliability and validity of assessment instruments is available for a number of systems. This is a promising sign. Regrettably, there are still too many system developers who may have slighted these important measurement aspects of their products.

In summary, we trust that this consumer oriented guide will prove helpful for those contemplating the purchase of one or more of the growing number of available products designed to assist in the assessment, vocational evaluation, and occupational exploration of those individuals who may benefit from alternative assessment modalities. The opinions expressed in the reviews of evaluation systems and software are those of the authors Brown, McDaniel, and Couch. In the final section of this book, opinions of consumers responding to a survey conducted by Mr. Michael McClanahan regarding systems and software are also expressed. These opinions may well be legitimately questioned by developers and other professionals in the field. The authors have a combined total of some 100 years in the practice and teaching of vocational evaluation and assessment in both the public and private rehabilitation sectors. This publication reflects those decades of experience that have shaped their opinions.

Clarence Brown
Randall McDaniel
Robert Couch
Michael McClanahan

I

Vocational Evaluation Systems

APTICOM

Precis

The APTICOM is a computer-based test battery consisting of tests in three areas. It is used for determining aptitudes, interests, and educational levels of students in regular or special education, those who are disadvantaged, and those served in rehabilitation settings. First, there is a vocational aptitude test addressing 10 aptitudes described by the Department of Labor. These adhere closely to aptitudes assessed by the United States Employment Service's (USES) General Aptitude Test Battery. The APTICOM vocational interest test relates to the 12 interest areas described in the Labor Department's Guide to Occupational Exploration. It was modeled after the USES' Interest Inventory. The third test (Educational Skills Development Battery) was derived from the six levels of the General Educational Development (GED) Language and Mathematical scales. Thus, the APTICOM replicates many of the features available in the USES' General Aptitude Test Battery. APTICOM's cost in 1992 for a single test console, materials, and a printer was $6,200. APTICOM was developed by the Vocational Research Institute of the Jewish Vocational Service in Philadelphia, Pennsylvania. Contact VRI at 1528 Walnut Street, Suite 1502, Philadelphia, PA 19102-3619. Toll free phone number 800-874-5387.

I. Description

The APTICOM is not really a work sample system but rather a computer-based series of aptitude, interest, and educational achievement tests built into a two-foot high, slanted display board (console) containing a dedicated computer. An attached stylus is used by the individual to record answer choices in the computer from multiple-choice options. The test items are contained on washable, plastic overlays with prepunched holes which are clipped to the console. There are five other tests of various physical capacities which require the use of apparatus separate from, but requiring the attachment to the console. The aptitude portion contains 11 specific tests for measuring ten Labor Department Aptitudes (color vision is omitted). There is a 162-item Occupational Interest Inventory. The Educational Skills Development Battery contains one test of Language Skills Development and another for Math Skills Development.

The optional padded case is recommended if the system is transported to multiple sites. The system is portable, but care should be exercised in transporting the computer; however, the system is basically sturdy and durable. Test results may be downloaded onto an IBM compatible personal computer for storage. The only expendable supplies are report forms and paper needed for the printer. Manuals for administration and for technical aspects are available and provide sufficient detail. A Spanish language edition is also available.

II. Administration

No specific training is required for the APTICOM other than that provided by the system salesperson. A 40-minute videotape is available. It covers set-up, administration, operation, scoring, and reporting instructions. One evaluator is generally needed for each individual taking the APTICOM. However, the APTICOM Maxi Systems (four machines connected) can be monitored by a single evaluator. Time to complete the entire battery is under two hours. The aptitude and educational sections require about one-half hour each but the interest test is untimed. Average time for its completion is less than a half hour. The evaluator reads the directions directly from the test manual and may supplement oral instructions with demonstrations. No prescreening is necessary, but a fourth grade academic level of functioning is needed for all except the educational development tests which test for all educational levels. A brief practice period is permitted prior to each test. The client is actively involved in reading test items and using the stylus to record his/her answers in the provided precut holes in the overlays.

III. Scoring, Interpreting, and Reporting

With the exception of the Interest Inventory, raw scores consist of correct answers on the Aptitude and Educational Development sections. The computer computes all scores and presents these in a variety of forms for further interpretation. The Aptitude test battery provides raw scores and standard scores for each of the 11 tests. Occupational Interest scores are presented in percentiles for the 12 GOE interest areas, and Educational Development scores are presented according to their correspondence with GED levels 1-4.

The premiere feature of APTICOM scoring is its vocational recommendations. The computer-generated report lists all appropriate GOE codes that are appropriate in light of the individual's higher interest scores and aptitude scores in relation to Occupational Aptitude Patterns. Work groups and specific job possibilities are listed along with DOT codes, Specific Vocational Preparation (SVP) and General Educational Development requirements. Cross references with other similar interest, aptitude, and educational levels are also provided.

IV. Measurement Properties

Norm Groups: Botterbusch (1987, p. 36) reports that technically correct norm groups were developed for the aptitude test in the United States and Canada. Norms for secondary students and adults are available for the Interest Inventory. Criterion referenced standards as opposed to norms were used for the Educational Development tests of Language and Math.

Reliability: Aptitude test-retest reliability ranged between a low of .65 to a high of .89 with most recorded above .80 indicating acceptable reliability. Regrettably no reliability was reported for the Educational Development tests in Language and Math Development. The standard error of measure was rather large.

Validity: More encouraging were concurrent validity studies comparing APTICOM tests with their DOL counterparts. Correlations of APTICOM aptitude scores with the GATB scores were impressively high at or above .80 for the cognitive aptitudes, .60s for perceptual aptitudes and .50s for dexterity factors. When compared with the U.S. Employment Service's Interest Inventory, the concurrent validity correlation ranged between .67 to .90.

V. Summary and Review

The APTICOM is an apparently suitable substitute for the United States Employment Service's GATB, interest inventory, and parts of its general educational development indicators. Individuals and practitioners who are unable to easily avail themselves of these services at their local USES will find the APTICOM an appropriate alternative.

The concurrent validity reported is impressive. The APTICOM seems to be a viable resource for vocational evaluators who want to do basic assessment with individuals.

The console and computer and other APTICOM apparatus may need refinement for greater durability. The system is prone to annoying little problems such as malfunctioning stylus and with the plug-in apparatus boards. (Note: The developers report only .18 replacement probes per machine and .04 repair calls per machine). Defending this charge VRI personnel explain that while some facilities may..."go through 2, 3, 4 probes per machine, per year; others use the same probe for 2, 3, 4 years without a failure (R. Lindsey, personal communication, August 10, 1992).

The data generated by the APTICOM--especially the vocational recommendations--should prove most helpful when combined with other evaluation data. The computer-generated report and the capability of downloading for client data storage are other strengths.

Career Evaluation Systems (CES)

Precis

Career Evaluation Systems (CES) is composed of three separate computer systems which score batteries of standardized test instruments and equate the results to job requirements identified by the Department of Labor in the 4th edition of the Dictionary of Occupational Titles. The three systems are: (1) CareerView (Series 100) for non-disabled average and above persons with no physical impairment seeking career advice, used primarily in business and schools; (2) VocScan for persons with physical impairments (Series 200) and for the low-literate who may also be physically disabled (Series 230); and (3) JobSupport (Series 300) for persons diagnosed as mentally retarded. All the systems are available as a unit, although the Series 100 may be purchased without the other two.

The system is available at a cost of $5,700. Additional information is available from Career Evaluation Systems, Inc., 6050 West Touhy, Chicago, IL 60648, phone number 312-774-1212.

I. Description

The present system can be traced to the work of Dr. Edwin Fleishman who isolated many of the factors found in individual jobs. Later, Dr. Edward Hester applied these principles in an effort to predict vocational potential of clients in Goodwill Industries of Chicago. Using factor analysis, Dr. Hester isolated 28 aptitudes that could be measured by a combination of apparatus and paper-pencil tests. Career Evaluation Systems continued the refinement of Dr. Hester's system leading to the present battery of 13 apparatus and 11 paper-pencil tests that, in various combinations, comprise the three Series of the CES. Test instruments selected and the corresponding Series to which the test applies are shown on Table 1 on the following page.

A six-part manual accompanies each of the Series. Part I includes general administration information, order of administration, and special instructions. Parts II and III contain information related to purpose, administration, scoring, and data entry of the apparatus and paper-pencil tests, respectively. Part IV provides specific information needed to complete data entry forms for subsequent computer input. Part V provides information on how to interpret the computer printout. Sample printouts are provided in Part VI. The developers are to be commended for the organization and clarity of the manuals.

Training and certification in the use of the system is required by the developer. Audio cassettes are used as the training medium along with a certification test that must be passed.

II. Administration

Since each Series requires the administration of a different set of standardized instruments, and since some instruments may be group administered, the total administration time will vary by Series. Total actual test time is as follows:

Series 100.....190 minutes
Series 200.....250 minutes
Series 230.....200 minutes
Series 300.....200 minutes

Once a Series has been selected and all tests administered and scored, the results are communicated to CES by mail, phone, or personal computer and modem. The company then "runs" the data provided resulting in a printout which is then mailed to the system user.

Table 1
Test Instruments and Corresponding Series

TEST NAME	SERIES			
Apparatus Tests	**100**	**200**	**230**	**300**
Purdue Pegboard	X	X	X	X
Tapping Board Test	X	X	X	X
Hole Steadiness Tester	X	X	X	X
Minnesota Manual Dexterity Test	X	X	X	X
Two-Arm Coordination	X	X	X	X
Etch-A-Sketch	X	X	X	X
Hand-Tool Dexterity		X	X	X
Depth Perception Apparatus		X	X	X
Multi-Choice Apparatus		X	X	X
Photo-electric Rotary Pursuit Tracker		X	X	X
Mirror Tracer		X	X	X
Hand Dynamometer		X	X	X
Pull Dynamometer*	X	X	X	X
Paper/Pencil Tests				
Minnesota Paper Form Board	X	X	X	X
Ravens Standard Progressive Matrices	X	X	X	X
SRA Verbal	X	X		
PTI Oral Directions	X	X	X	X
Gates-MacGinitie Reading (avg/above)	X	X		
WRAT Arithmetic	X	X	X	X
IPAT CFIT-1 Similarities				X
IPAT CAB-Cf Hidden Designs	X	X	X	
IPAT CAB-Ca Decision Speed	X	X		
SRA Leadership Opinion Questionnaire	X	X		
SRA Sales Attitude Checklist	X	X		

*Optional if medically unfeasible.

III. Scoring, Interpreting, and Reporting

All scoring is performed by the company upon receipt of raw scores by any of the methods mentioned. The resulting printout is then provided to the user and includes some interpretive information. The user must then rely on the information found in Part V of each Series manual for additional interpretive guidelines.

The returned printout includes sections on client identification information, scaled scores from each ability subtest administered, reported on a 1 to 6 (low to high) scale; relationships between client performance and Data, People, Things worker functions categories; and a list of job titles with accompanying DOT code and page number, GOE codes, strength levels, and SVP levels. The system has the capacity to list up to 165 occupations. These job listings are classified into one of four groups reflecting the probability of occupational success for the client: very feasible, feasible, possible, and conceivable.

IV. Measurement Properties

The developers note that since all of the paper-pencil tests are from nationally recognized publishers, all are fully documented in terms of their statistical properties in each test manual. While true, the CES uses these scores in combination to predict client vocational possibilities.

Norm Groups: The system is both norm-referenced and criterion-referenced. Normative data from a 1988 norm study is reported in the official user manual for the Series 100 (N=768) and the Series 200/230 (N=1210). These cases were selected from the existing CES database. The Series 100 included 98% non-disabled subjects while the Series 200/230 included approximately 60% disabled (orthopedic, mental, social).

Criterion-referencing for the system is based on the Worker Qualification Profile of the Department of Labor's Dictionary of Occupational Titles. The system relates client ability and aptitude scores to the 24 worker functions of the Data-People-Things hierarchy. The high scores on all levels of Data-People-Things are selected to form the basis of the occupational match.

Reliability: Test-retest reliability of the system is reported using a 1979 study of forty-four clients. The reliabilities of all tests ranged from .72 to .95. The developers contend that the most important aspect of reliability is the ability of the system to identify the same list of jobs on retesting. Using this 1979 study, 78% of the job families identified on the first printout were also listed after retesting.

Validity: Efforts to establish content and/or construct validity are reported in the user manual. Factor analytic studies have established that all tests used in the CES are measuring independent traits. An unpublished 1983 study reported that of 30 persons placed during a one-year period in jobs identified on the printout, all 30 were still employed on those jobs at the end of 11 months. A 1985 study reported that 24 of 26 persons evaluated with the system were satisfactorily employed in positions recommended on their printouts.

V. Summary and Review

Information generated through the administration of the battery of standardized tests in the system would be useful in assisting evaluees to identify areas of strength as well as weakness. The emphasis on psychometric testing would be appealing to most evaluators since this is a frequently used assessment methodology. In addition, many vocational rehabilitation programs may already have many of the tests specified. The various Series of the CES represent an effort to avail the user of a single system appropriate for persons ranging from those with limited skills to those aspiring to professional occupations.

The purpose of the assessment conducted using the CES system is to generate a profile of client aptitudes which can then be compared to the Data-People-Things arrangement of jobs used by the Department of Labor. The Series 100 includes 2,300 occupations; the Series 200/230 has 2,400; and the Series 300 contains 1,400. Series 100 and 200/230 jobs were identified based on their availability in the national economy and their representativeness of a group of closely related occupations (Botterbusch, 1987). Series 300 included jobs which the mentally retarded should be able to perform. The developers would be well served to provide additional information on the specific procedures employed to select jobs for inclusion into each of these job banks.

Finally, the developers are encouraged to continue conducting studies to support the usefulness of the system. Particular emphasis should be placed on the predictive validity of the system.

Computerized Assessment (COMPASS)

Precis

Computerized Assessment (COMPASS) was created in 1991 from a combination of elements of MESA Short Form (VALPAR, 1985) and INSIGHT (VALPAR, 1987). The system is criterion-referenced to the Department of Labor system of job analysis and classification and measures an individual's skills, knowledge, and abilities as they relate to jobs and training programs using the rating system of the Handbook for Analyzing Jobs and the Dictionary of Occupational Titles.

According to the manual, COMPASS is "a screening instrument designed to quickly establish that evaluees have various degrees of work-related and academic skills. It also highlights potential skills deficits and areas needing more in-depth assessment." The system can either stand alone or function as part of a larger program called System 2000. The product was developed by the VALPAR International Corporation, P.O. Box 5767, Tucson, AZ 85703-5767, phone number (800) 528-7070. The cost of the system is $3,395.

I. Description

COMPASS includes 12 computer-based subtests, three out-of-computer work samples, and two out-of-computer surveys. “Out-of-computer” simply means the work samples and surveys do not involve the use of a computer for administration. These measures are analyzed and yield 17 factor scores which form a Worker Qualifications Profile reflecting client level of performance in the areas of Data-People-Things, GED reasoning, math and language, and the 11 Department of Labor aptitudes (General, Verbal, Numerical, etc.). Many of these factors are computed by combining the results of several of the subtests. If one or more of the subtests are not administered, some of the factors will not be computed.

The manual provided supplies all the details that the evaluator needs to set-up, administer, score, and interpret the system. Diagrams of all out-of-computer exercises assist the evaluator in set-up and in the proper method of demonstration of the various tasks. Under normal working conditions, the COMPASS would be relatively maintenance free.

II. Administration

The entire battery can be administered in approximately 70 minutes. The time would vary depending on the ability level of the client. While there are no specific training requirements in the use of the system, the developer recommends that the evaluator read and fully understand the manual, self-administer the COMPASS, and administer the system to several volunteers.

The computer subtests use several adaptive testing techniques including "double practices when necessary, structuring (leveling) the content of each exercise within a subtest from easiest to hardest, and discontinuing when not enough correct responses are demonstrated at a specific level." The computer tests may be administered to the hearing impaired through the use of a visual cue as opposed to the usual auditory cue used for the non-hearing impaired. Computer subtests are automatically terminated if a subject does not complete a skill level successfully.

Out-of-computer hardware subtests which include a wiring box, mat, hard plastic block, and tool case are administered by the evaluator using both verbal instruction and hands-on demonstration. Evaluator instructions are clearly described in the administration manual. If the subject does not appear to understand the task, the evaluator is allowed to give extensive instruction. It is important that the evaluator be assured the client understands the task prior to beginning

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the timed test. The two paper-pencil surveys are self-administering but can be read to the client if necessary.

The developer makes no mention of required order of administration among the three components of the system. The computer automatically administers all 12 subtests with accompanying practice sections in a preset sequence. Order of administration can be altered by the evaluator. Given the design of the system and the nature of the components, it is recommended that the client/evaluator ratio not exceed 2:1.

III. Scoring, Interpreting, and Reporting

Scoring time is minimal since the computer subtests are scored internally. The hardware subtests are scored by awarding points for completing the tasks within the allotted time, for proper use of tools, and for number of errors committed. Examples of errors are clearly described in the manual. All scores for each work sample are recorded on the evaluee's scoring sheet and then entered in the computer. Scores from the two surveys are entered into the computer using the Data Entry Option for the COMPASS. All the test scores combine to generate a Worker Qualification Profile representing the subjects level of performance for the factors from the DOL.

The Quick Check is the first of two reports that can be generated. It lists the subtest scores and the subtest score ranges. Also included are notations if multiple practice sessions were required. A display of DOT factor scores are also presented.

The DOT Report, generated by the computer, includes rating scales as well as free narration, demographic data, profile analysis, Data-People-Things levels, GED levels, aptitude levels, and vocational interest (GOE) areas. The results are easily read and understandable.

IV. Measurement Properties

In 1982 VALPAR developed the MESA system. Next, several short versions of this battery were produced including the MESA Short Form (1985), MESA Short Form 2 (MSF2, 1986) and INSIGHT (1987). The COMPASS is a revised combination of elements from the MSF2 and INSIGHT systems.

The technical manual presents data gathered on all systems preceding the COMPASS but no data related specifically to the COMPASS.

Norm Groups: Since the COMPASS, like its predecessors, is a criterion-referenced measure, norm groups are inappropriate. All test batteries are criterion-referenced to the Department of Labor system of job analysis described in the Handbook for Analyzing Jobs (1972), the Dictionary of Occupational Titles (1977), its supplements, and related publications. In addition, VALPAR staff and a panel of independent experts were used "to establish grade level/DOL factor level equivalencies."

Reliability: Test-retest reliability coefficients for MESA subtests contained in INSIGHT ranged from .89 to .95. In 1985 these same subtests were incorporated into MESA Short Form. A group of employed workers (N=45) then took both MSF and MESA. Subtest correlations between these two systems ranged from .71 to .91. The developer then concludes that these subtests are "consistent measures, regardless of the test battery that incorporates them."

Internal consistency analysis of the academic and memory subtests of INSIGHT indicated yielded KR-20 coefficients indicating test items to be homogeneous.

Validity: A number of studies reported in the technical manual reflect efforts to establish content validity (INSIGHT), criterion-related validity (MSF2), and construct validity (MESA). Results of these studies do provide evidence that these tests do measure what they purport to measure.

V. Summary and Review

The COMPASS is a compact evaluation system criterion-referenced to the Department of Labor system of job analysis and classification that can be administered in a relatively short period of time. While one might easily understand the rationale for relating performance scores to DOL level criteria, no specifics are given as to how individual performance scores are converted to these levels. The computer-based testing format is especially appealing to many persons who have some experience with the technology. Coupling the computer tests with hands-on tasks contributes to maintaining client interest through the testing process.

Hester Mobile Vocational Evaluation (MVE)

Precis

The 1990 MVE is a refined, streamlined, portable version of the earlier Hester Evaluation System. Developed and marketed by Hester Evaluation Systems of Topeka, Kansas, the MVE is designed to assist any person, regardless of disability, in determining a suitable vocational direction. It is described by its developers, Dr. Ed Hester and his colleagues, as a computer based "...testing system that combines 19 separate ability factors with 17 personal characteristics" which lead to job recommendations from the Dictionary of Occupational Titles (DOT) and major interest areas from the Guide for Occupational Exploration (GOE). The system consists of eight apparatus-type tests and a battery of nine standard, commercially available paper-pencil tests which produce a total of 24 scores. These scores are fed into a personal computer (not included) which produces a printout of aptitude-rated jobs related to specific DOT and GOE codes. The entire system is packaged in a large suitcase size, portable carrying case. Cost is $4,195. Contact Hester Evaluation Systems, Inc., 2410 Southwest Granthurst, Topeka, KS 66611-1274, phone 800-832-3825 or 913-357-0362.

I. Description

The Hester Mobile Evaluation System (MVE) is packaged neatly in a durable portable case. Ed Hester (1991) notes that it is "a truly portable system that makes it ideal for urban and rural settings...it is extremely popular with private rehabilitation specialists" [p. 1]. Several of the apparatuses require power and the "batteries included package" does indeed add to its portability. The only expendable supplies are locally replaceable pencils and scratch paper. Additional answer sheets are readily available from the developer.

The manual is very detailed and includes administration procedures, modifications for special populations, scoring, set-up instructions, and maintenance of the equipment. Each standardized individual test has its own manual.

The system is based on relating test battery scores to the Department of Labor's job classification schemes (DOT, Handbook for Analyzing Jobs, and Guide for Occupational Exploration). Since each test is administered independently, there is no recommended grouping of tests. Some tests are given individually while others are administered in groups. Normal administration procedures require clients to stand for certain tests.

The following brief description of the MVE components indicates the types of testing involved. The components requiring an apparatus are described in more detail than the standard, better known paper-pencil tests included in the battery. These are simply listed with a primary purpose.

APPARATUS TESTS:

1. Lafayette Pegboard - This individually administered test measures the ability of the client to manipulate small objects through a small space.

2. Tapping Board - This test measures one's ability to make rapid wrist movements.

3. Hole Plate (w/o backing plate) - This test measures one's ability to hold one's hand and arm steadily in a specific position for a short period of time.

4. Minnesota Dexterity Test - This test measures the client's ability to skillfully, but rapidly, manipulate relatively large objects.

5. Two-Arm Tracing Apparatus - This test involves the ability to move both arms in a simultaneous, coordinated manner.

6. Hole Plate (w/backing plate) - This measures the ability to move one's hand to a precise stationary position. It differs from Item #3 since it requires a person to move his or her hand to a particular position rather than holding it stationary.

7. Reaction Time Module - This measures the speed of response to an external cue.

8. Etch-A-Sketch Maze with Overlay - This measures the ability to move both hands in a coordinated manner to accomplish a specific task.

PAPER AND PENCIL TESTS:

1. Minnesota Clerical Test - Measures clerical aptitude.

2. Minnesota Paper Form Board, Form AA - Measures spatial perception.

3. Raven's Progressive Matrices - A test of abstract reasoning.

4. SRA Verbal Form - Measures verbal and numerical reasoning.

5. Oral Directions Test, Form S - A group test measuring one's ability to follow directions.

6. Gates-MacGinitie, Survey D, Comprehensive Section - This group test assesses the reading grade level of the client.

7. Wide Range Achievement Test, Level II - This test measures the arithmetic grade level of the client.

8. Leadership Opinion Questionnaire - This group test measures structure and consideration.

9. Sales Attitude Checklist - This group test measures the sales attitude of the client.

II. Administration

MVE developers suggest that administrators practice taking the tests and giving them to fellow workers before administering them to clients. In this way, the test administrator familiarizes himself/herself with the tests and gains a fuller understanding of the factors to be tested. No formal training is required, but the developers caution that those administering the MVE should have a thorough understanding of measurement principles and the job classification schemes of the U.S. Department of Labor.

Several tests require one-on-one administration while others may be administered in groups. Verbal instructions and demonstrations are given for each of the hands-on tasks. For the paper-pencil tests, standardized verbal instructions are given as dictated by the test manual. For some individuals, the instructions may have to be repeated and/or augmented or the testing procedure demonstrated several times. To facilitate the client's understanding, there is a practice time included for each of the tests. During the practice time, the evaluator points out those tests which require speed and accuracy. No assistance is provided to the client after the practice time has ended. Modifications in administration procedures can be made only if the problem in administering the test is not related to the factor being tested. Clients are required to take all 17 tests. The time required for each test varies. The timed tests included in the battery may be completed in under two hours, but the time required for the eight tests without a time limit varies considerably.

III. Scoring, Interpreting, and Reporting

The battery of 17 tests/samples yields a total of 24 time or error scores that are entered on a provided data entry form. The evaluator is also asked to enter client data related to Worker Traits from the Handbook for Analyzing Jobs. Using the provided software, the data is then entered into the computer resulting in a printout of jobs with accompanying DOT code which gives a 1 to 6 (highest) rating for jobs in which the client shows aptitude. The various printouts also show GOE codes and ISA (InterSurvA) Interest Inventory interests. This considerable data on the printouts can be used in the appendix of a narrative vocational evaluation report or perhaps serve as the report itself. Although the manual explains fully the meaning of each test result and possible interpretations, the developers intend for the MVE to serve as an aid for the practicing evaluator and not an end in itself.

The printout results provide: 1) A list of jobs for which the evaluee has at least minimum aptitude (on a one to six scale), 2) An interest area based on the Guide for Occupational Exploration (GOE), 3) An interest score based on the 210 occupations contained in the ISA Interest Inventory, 4) Estimates for the client regarding his/her ability on Worker Trait Group arrangements.

IV. Measurement Properties

The manual is cautious in recommending standard procedures in administration of the MVE and the separate manuals for the commercial, paper-pencil tests, and report information on reliability and validity for each of the tests included in the battery. However, the MVE manual makes no mention of any measurement properties or research done on the entire MVE battery nor on the non-commercial apparatuses created by the developers. This absence of data relating to reliability and validity is a strange omission.

V. Summary and Review

The MVE has a long history of continued refinement. The portability of the system is a real asset. The manuals are comprehensive yet understandable for such a complex battery. The printouts produced by the system are impressive in providing a wealth of information about aptitudes and interests of a client as well as a plethora of job possibilities which can be explored in subsequent counseling. The availability of DOT and GOE codes could likewise prove a valuable resource for vocational exploration. The relatively short time required for an evaluation with the MVE is another plus as is the competitive price for the system. Its durability is also impressive.

On the negative side, one might envision losing some of the many parts contained in the MVE. An IBM compatible computer is required. This might require a sizeable additional expenditure and excludes the non-IBM compatible (Apple) personal computer users. The tests, although novel, do not resemble real community jobs, and this factor could possibly cause some loss of interest by evaluees. The largest flaw is the system's lack of technical data regarding reliability and validity. Can one rely on the system to consistently measure the factors in question? Does the MVE do what it purports to do? Frankly, based upon the available data, one does not know. The exception is the individual test scores included in the battery which report reliability and validity information in the separate test manuals. The total battery results reported in computer printouts, however, would remain suspect until such reliability and validity studies are made available.

Key Educational Vocational Assessment System (KEVAS)

Precis

The Key Educational Vocational Assessment System (KEVAS) was designed for both general and special needs clients, ranging from junior high school age through adulthood. The developer notes that the system is appropriate for dislocated workers, economically disadvantaged, emotionally disturbed, learning disabled, and the educable and trainable mentally retarded but less appropriate for those with severe physical and mental disabilities. The system uses computer technology and traditional paper-pencil tests to measure individual performance in the areas of psychophysical functioning, work-related competencies, and social and motivational functioning.

Key Education offers different pricing plans to allow for individual agency needs. Purchase price of the entire system (Personal Testing System, printer, and peripherals) is $15,000. A $5 per test fee is charged for supplies and materials. With a second option, the company provides all related materials and supplies for an annual per test fee. Under this option, all maintenance and service are provided at no charge; if the unit fails, a replacement unit will be shipped via overnight express also at no charge. The system is available from Key Education, Inc., 673 Broad Street, Shrewsbury, NJ 07702, phone number 201-747-0048 or 800-25-KEVAS (outside New Jersey).

I. Description

The KEVAS-PTS (Personal Testing Station) features a portable, computer-assisted test station with accompanying specialized hardware and standard paper-pencil tests. The PTS is used for test administration, data management, test scoring and recording, and for report production and job matching. The complete system includes one KEVAS-PTS unit, one hand gauge, one set of headphones, one foot switch, printer peripherals, and one power surge protector. The system measures 22 areas of functioning in the following classifications:

Measures of Psychophysical Functioning

Hand Strength
Visual Reaction Time
Auditory Reaction Time
Combined Visual-Auditory Reaction Time
Visual Acuity
Color Acuity
Auditory Acuity
Auditory Memory
Visual Memory
Fine Motor Skills
Non-Verbal Learning Ability

Measures of Work-Related Competencies

Literacy
Reading Ability
Computational Ability
Spatial Relations
Supervisory Knowledge

Measures of Social and Motivational Functioning

Manual Persistence
Social Competency
Expressed Vocational Interests
Temperament Factors
Structured Interview

II. Administration

A series of performance tests administered using the KEVAS-PTS with associated peripherals and paper-pencil tests are combined with client historical, medical, and additional demographic data. The subject need not have prior knowledge of computers to operate the PTS.

The number of subjects tested during a session is dependent on the number of examiners and the number of PTS units. Subtests administered using the PTS take approximately 40 minutes. Another 30 minutes is required for the examiner administered instruments, and at least 2 hours are needed for various paper and pencil tests. Total administration time, therefore, would be approximately 3 1/2 hours.

III. Scoring, Interpreting, and Reporting

KEVAS-PTS tests are computer scored and interpreted. Paper and pencil tests are hand scored using the scoring keys furnished and the results entered into the KEVAS-PTS according to a formula provided.

KEVAS software translates individual raw scores into an interpreted score reported as a performance rank. The seven performance ranks used to describe individual test results are: Superior (significantly above the norm); Above Average (above the norm); High Average, Average, Low Average (within normal limits); Below Average (below the norm); and Impaired (significantly below the norm). Results are compiled into an interpretive report that includes a graphic summary of individual performance across all areas tested. A profile of expressed vocational interests is given, and vocational training or placement recommendations are listed with DOT titles and codes. Intervention recommendation for use in counseling and in providing referral services is another feature.

IV. Measurement Properties

Norm Groups: Norm referenced KEVAS results are presented on the seven point scale mentioned earlier. Those subtests which are norm-referenced include: Auditory Localization, Auditory Memory, Reaction Time, Fine Motor Skills Time/Accuracy, Hand Strength, Manual Persistence, Spatial Relations, Time/Accuracy, Visual Screening, Social Functioning, Supervisory Knowledge, and Arithmetic Skills. Auditory Acuity, Visual Acuity, Color Vision, and KEVAS Language Series subtests are criterion-referenced.

Reliability: Reliability data on tests administered through the KEVAS-PTS were presented in an available technical manual. Reliability coefficients were reported on a normal adult population and a population of educationally handicapped eighth and ninth graders. While some of the coefficients are considered low (.48 - Manual Persistence, Normal Adult Population; .55 - Manual Persistence, .56 - Visual Memory/Learning Ability, .50 - Auditory Localization; and several others in the .60 range for the Educationally Handicapped), most are considered in the acceptable range.

Validity: One predictive validity study was reported in addition to the two studies identified by Botterbusch (1987). This study predicted rehabilitation outcomes of "good" or "limited" using KEVAS results. Vocational rehabilitation counselors provided information on client outcomes. Using chi-square procedures, the correlation between the KEVAS ratings and client outcomes was .63. Two studies related to the content validity of the KEVAS were also summarized in the technical report.

Construct Validity: A principal components analysis of the KEVAS subtests was conducted on a sample of 517 adults. The analysis produced 12 factors with eigenvalues greater than one, lending credence to the theoretical basis of the subtest clusters.

V. Summary and Review

The KEVAS is a portable system making it attractive to those responsible for conducting mobile evaluations. While the Personal Testing System methodology is in keeping with present day technology, many evaluees may find it difficult to relate the tests to the "real" world of work. This lack of face validity makes client orientation to the system critically important.

Efforts to support the system with statistical data are to be commended. Materials provided for this review, however, failed to identify and describe the norm groups used for the norm-referenced tests in the system.

The final computer-generated report is an attractive feature of the system. The developer is encouraged to provide information on how the test results are converted leading to the selection of job matches from the DOT. More information on the procedure used to select jobs for inclusion in the job bank is also recommended.

McCarron-Dial Evaluation System (MDS)

Precis

The MDS is a battery of tests developed primarily to assess factors leading to predictions of an individual's level of community employment/placement. It was originally designed for persons who are neurologically disabled but can be used for most disability groups. Cost of the system ranges from a basic price of $4,500 to approximately $10,000 for a complete package including all options and software programs. Contact: McCarron-Dial Systems, Inc., P.O. Box 45628, Dallas, TX 75245, phone number 214-247-5945.

I. Description

The McCarron-Dial Evaluation system is packaged neatly in four briefcases for mobility. MDS consists of a battery of standardized commercial and developer tests designed to assess five factors within three basic dimensions: (1) Verbal-Spatial-Cognitive (VSC=ability to learn and achieve language skills); (2) Sensorimotor (SM=physical functioning neuromuscular development, coordination, hearing, visual acuity, etc.); and (3) Emotional Coping (EC=interpersonal skills, maladaptive behavior, etc.).

Included in the basic MDS package are a number of standardized, commercially available tests including: Peabody Picture Vocabulary Test-Revised, the Bender Visual Motor Gestalt Test, Behavior Rating Scale, Observational Emotional Inventory, Haptic Visual Discrimination Test (HVDT), and the McCarron Assessment of Neuromuscular Development (MAND). Instruments which are not included in the basic system but can be used in the assessment and scoring are the Wechsler Intelligence Scales, various achievement tests, memory tests, and Street Survival Skills. McCarron-Dial developers have devised still other instruments which can be used to provide supplemental data or test results that can be substituted for certain test scores in the battery.

There is a detailed, comprehensive manual and three other manuals devoted to administration of the MAND, the Haptic, and Street Survival Skills. There are no expendable supplies other than developer-provided score sheets, and the system components are made of durable wood, hard plastic, cloth, or metal. Because there are so many small parts, missing pieces could possibly present a problem. Replacement parts must be ordered from the developer to assure standardization. There are six optional computer software programs available for in-depth data analysis, interpretation, and reporting results of the MDS evaluation.

Based on a neuropsychological model incorporating operation principles of the brain, the multifactor MDS battery leads to predicting an individual's level of community employment (transitional, semi-skilled, skilled, or professional/managerial) and/or supported or sheltered placement (daycare, work activity center, supported employment). The system can also be used in educational assessment and for neuropsychological diagnosis. Feedback from field use and extensive research findings have contributed to recent revisions and continued refinement.

II. Administration

Formal basic training in MDS is a pre/co-requisite for purchasing and administering the system. Approximately a dozen basic training programs are scheduled in various locations around the country each year. Tuition costs for basic training is $375 per person ($300 in Dallas) plus expenses. Advanced programs are also available.

"The McCarron-Dial System is based on a rational model of evaluation. Such a model consists of specifically defined processes as data gathering, hypothesis formulation, and hypothesis testing" (McCarron-Dial Systems, 1986, P. II, 1). Accordingly, MDS' manual recommends first collecting and reviewing the case history of the individual. Then the system components are administered individually in a sequential order for each of the five factors assessed. Some flexibility is permitted to accommodate special needs. Certain supplemental instruments can be administered and behavior observations can be made in school, in work oriented facilities, or in community job settings. Other assessment instruments will likely require private space, e.g., office, evaluation unit, clinical setting. The packaging does facilitate needed portability for mobile units, multiple school use, or in private rehabilitation practice.

Procedures-instructions, materials needed, and layout are described in sufficient detail to assure standardization. All instructions are given orally, and demonstrations are used as directed. The individual being tested is involved, yet standardization somewhat limits the level of involvement. Time needed for the abbreviated, basic battery is about three hours. The comprehensive battery requires up to five days and includes the supplemental tests and up to ten hours for observation. The test is administered individually.

III. Scoring, Interpreting, and Reporting

Scoring varies for each of the individual tests employed in the MDS battery and can be done by the evaluator. Time and error scores are used throughout the battery, and quality norm-error scores are combined with time scores to obtain a raw or performance score that may be compared with available norms. Developers offer computer scoring assistance for a fee at the Dallas headquarters, but no other scoring aids are used.

In interpreting the MDS results, emphasis is on educational and vocational programming and placement levels. In addition to recommended placement levels, specific strengths and deficits identified in evaluation can be used in program planning. For instance, deficits can be targeted for remediation in the Transition IEP (Individual Evaluation Profile) or in individual adjustment plans. Results should also prove helpful in determining eligibility for rehabilitation and who should best be served in supported employment and/or independent living programs.

Although no specific job recommendations are offered, the McCarron-Dial's optional Occupational Exploration System (OES) assesses MDS test data and provides a list of compatible career areas, worker trait groups, and Dictionary of Occupational Titles which might be worthy of further exploration.

Two forms (Individual Evaluation Profile and the Individual Program Plan) aid the evaluator in planning the final evaluation report. The standard recommended MDS report format for comprehensive reporting includes specific individual scores, case history, vocational and residential placement predictions scores, behavioral observations, lists of strengths and weaknesses, and program recommendations. Optional, computer-based reporting aids are also available.

IV. Measurement Properties

Norm Groups: Norms are available for most of the instruments featured in the McCarron-Dial System battery. Pertinent empirical and statistical characteristics are offered in the manual for each instrument and in published research.

Reliability: Reliability studies are presented in the various manuals with test-retest reliability coefficients ranging from .67 to .99 for the MAND and .90 and .93 for the Haptic.

Validity: A major strength of the McCarron-Dial System is its repeatedly demonstrated construct, concurrent, and predictive validity as reported in various validity studies. For instance, the reported predictive validity correlations between the HVDT and work potential ranged from .53 to .86. The predictive validity between MAND and Work performance was .70.

V. Summary and Review

The McCarron-Dial Evaluation System can perhaps best be described as primarily a comprehensive psychometric test battery rather than a more traditional work-sample or vocational evaluation system. Yet, it can certainly be used effectively to ascertain potential employment levels, individual strengths, needs, functional limitations and problems, career direction, and recommendations for future special education or rehabilitation programs. The McCarron-Dial Evaluation System offers an excellent model in developing, establishing norms for, researching reliability and validity, and for continually refining an evaluation system.

The complete MDS with all its options is comprehensive and will be professionally time consuming. Some evaluators will not be willing to devote the time necessary to administer the basic and supplemental tests needed for a complete client evaluation. Those who use the MDS will need a solid foundation in measurement principles in addition to the required MDS basic training. Few evaluation system manuals are as detailed and complex. In fact, the four MDS manuals are so comprehensive that the untrained evaluator will probably have difficulty understanding them. The basic system testing activities leave little room for vocational exploration, and test battery tasks do not resemble recognizable community jobs. The results do not recommend a specific best job for the individual. Despite these limits, those using the complete MDS and all its options will be rewarded with a reliable, valid, and realistic picture of their client with disability.

Microcomputer Evaluation of Career Areas (MECA)

Precis

The MECA is one of 12 modules in the larger Education for Employment system. The MECA module is a set of 15 microcomputer "hands-on" career exploration and assessment kits. Each of the kits in the MECA is a "work-oriented package designed to assist the participant in developing a more realistic occupational goal" (MECA Manual, 1992, p. 1-1). The manual also mentions use of the program to assist students, employees, or clients to overcome barriers to employment and for use in academic and/or technical skill training.

Each career kit can be purchased separately using one of two options. Option 1 is the purchase of the complete kit (computer software, manuals, hardware, hand tools, supplies, administration forms, and packing case). The purchase of all 15 complete kits under this option is $8,995 with individual units ranging from $425 to $695. Option 2 includes the purchase of only software program and administration manual for each of the 15 kits and is suggested for programs with limited budgets. Under this option each kit is sold separately for $250. The cost for all 15 is $3,600 but would require the purchaser to obtain all necessary hardware, tools, and supplies to administer each work sample. Individual Learning Activity packets for each specific career area are $79.95, and the cassette control device is $79.95. The system is marketed by the Conover Company, P.O. Box 155, Omro, WI 54963, phone number 800-933-1933.

I. Description

Each module incorporates the multiple-trait factor method of assessment. This method simply means that several factors are measured during the assessment process.

The current 15 career areas included in the system are: automotive, building maintenance, business and office, computers, construction, cosmetology, custodial, distribution, electronics, food service, graphic design, health care, horticulture, manufacturing, and small engines. Each kit contains computer software, associated hardware, hand tools, supplies, administration forms, administration manual, and package case. Each kit contains three work samples and a Learning Activity Packet used to relate basic academic skills to particular interest areas. A manual accompanying each kit is logically organized and easy to follow.

Each of the modules requires the use of expendable supplies which can be purchased locally or from the developer. Hardware associated with each kit is described to allow for identical replacement if necessary. In the event of defect, the developer will replace manuals and/or software at no charge to the purchaser. In addition, updates of the products will be provided at no additional cost. Forms required for each kit can be reproduced by permission of the developer. In general the kits seem durable under normal usage.

II. Administration

According to the developer, each work sample can be administered in approximately 30 minutes through the use of a microcomputer. Each kit is a simulated work activity allowing the participant to explore a particular career area, identify interests and abilities which relate to various careers, and identify specific academic abilities necessary within an interest area. Training in the use of the system is not a requirement but is available through the developer.

Instructions are provided to participants verbally, on the computer screen, and on paper. A cassette control device can be used for low- and non-reading users. During administration of the sample, evaluator checkpoints provide a method of additional instruction. The manual makes no mention of practice trials or specific criteria which must be met prior to administering the sample.

The evaluator-to-participant ratio depends on the number of kits available. Though the manual makes no mention of an appropriate ratio, an evaluator experienced in the use of the system should be able to monitor 4 to 5 participants simultaneously.

III. Scoring, Interpreting, and Reporting

Each sample is scored based on total time for completion and quality of performance. Times are compared with the performance of individuals in the norming population to arrive at a rating of 1 (high) to 5 (low). Quality standards have been established based on errors made, frequency of occurrence, and the severity of the error, i.e., major or minor. These errors are clearly defined for each work sample. At various checkpoints, the evaluator counts the number of errors and records them on the Interest Reaction Form. Quality and time are given equal weight.

Each work sample requires the completion of the Interest Reaction Form and an abbreviated version of the Materials Development Center (MDC) Behavior Identification Form (Botterbusch, 1985) (used by permission). The Interest Reaction Form includes a section completed by the participant indicating interest in the subtests of the sample administered and a section to be completed by the evaluator relating to errors committed and time to complete each subtest of the sample. The evaluator also rates the participant on Primary Skill Factors and Secondary Overall Skill Factors relevant for each work sample. The Behavior Rating Form is located on the back of the Interest Reaction Form and is used to rate the participant on 22 operationally defined categories of behavior.

If no printer is available, the Interest Reaction Form is used to record results. If one wishes to compile a complete report, a computer produced VOCREPORT program is available from Conover Company which summarizes information from all other MECA components. The multiple traits measured are "keyed" to a specific job title which interfaces with a major career interest area within one of the 66 worker trait groups of the Dictionary of Occupational Titles.

With the use of another Conover Product, the Career Planning System (CPS), the client rates his/her interest and performance on each section of the work sample. The CPS can also be used to relate work sample results to educational planning.

IV. Measurement Properties

Norm Groups: The manual mentions only composite norms to be used by the purchaser while more data are being generated. No description of the group used for these composite norms is provided.

Reliability: No data provided.

Validity: No data provided.

V. Summary and Review

The 15 work samples of the MECA system represent one module from a larger system called the Education for Employment System. Ideally the work samples would be used to generate a "piece" of the data necessary for the development of a composite participant profile. Each module can be used in isolation from this larger system, however, to assist participants in exploring occupational areas of interest. The use of hands-on activities combined with user-friendly computer technology are appealing features of the system.

The most glaring weakness of the system is its lack of empirical data (i.e., reliability, validity, lack of normative data) to support its face validity. The system could be useful in relating work sample performance to secondary vocational training for transition-age students. Establishing validity and reliability of the system should be a priority especially in light of the developmental effort invested in the system thus far. Without such empirical evidence one is unsure of the utility, consistency, and accuracy of the MECA system.

Micro-TOWER

Precis

Micro-TOWER consists of 13 group-administered work samples subsumed under five aptitude clusters. It is designed to measure General Educational Development and eight Department of Labor aptitudes needed for a wide range of skilled and unskilled jobs. Micro-TOWER is applicable for all disability groups and may be used as a screening device prior to a more indepth vocational evaluation. Micro-Tower was developed and published in 1977 by the noted International Center for Disabled in New York. Cost for Micro-TOWER varies depending upon the number of clients one desires to evaluate at one time. A complete package of all 13 self-contained work samples suitable for testing five clients at a time is $6,015. Contact: Micro-TOWER, ICD Rehabilitation & Research Center, 340 East 24th Street, New York, NY 10010.

I. Description

Micro-TOWER was developed and refined over a period of several years. The resulting group-administered work samples under their appropriate clusters are as follows:

Verbal

1. Want ad comprehension
2. Message taking

Numerical

1. Payroll computation
2. Making change

Motor

1. Bottle capping & packing
2. Electronic connector assembly
3. Lamp assembly

Spatial

1. Blueprint reading
2. Graphics illustrations

Clerical Perception

1. Mail sorting
2. Filing
3. Zip coding
4. Record checking

The Micro-TOWER system features high quality, durable parts. Each sample is packaged separately and is self-contained.

The only mechanical equipment is the cassette cut-stop tape player. No computer is required. A few samples include containers and parts (lamp assembly, connector assembly, bottle capping) but most are paper-pencil type tests. Illustrative charts (photo book) depict jobs related to each sample. Manuals include: a procedure manual for each work sample, a general administration/ scoring manual, and a technical manual.

II. Administration

Micro-TOWER is based on the Worker Trait Arrangement classification system and the aptitudes described in U.S. Labor Department publications. It purports to measure eight of the eleven aptitudes. No formal training is required but a three-day Micro-TOWER training program at the International Center for the Disabled (ICD) in New York (for one individual) is part of the purchase price. Travel and living expenses while in New York are extra costs. Other training options are available. Since the Micro-TOWER itself can be used as a screening device, no particular pre-screening is necessary. Micro-TOWER can be administered to groups of 10 or more individuals by a single evaluator. The space needed depends on the size of the group. For instance, six clients would require at least 224 square feet of space. Prior to beginning each work sample, the group is shown large photos of individuals working on specific jobs depicting a wide range of occupations covered by the sample. Each work sample has a practice period in which group members learn the steps necessary to complete the work sample. The cassette recording informs the individuals when to start and stop thereby freeing the evaluator of the necessity to time the sample. At the end of each day, a group discussion is conducted by the evaluator to explore reactions to the particular samples completed by the group. The actual time needed to administer all work samples is 14.5 hours. However, with breaks, group discussions, and other delays, total time for the group evaluation approaches 20 to 25 hours. Developers suggest that three to five days are generally needed to complete the battery including the daily discussion sessions. There is no standard sequence for administration of the work samples.

III. Scoring, Interpreting, and Reporting

All Micro-TOWER samples are timed, but the raw scores are the number of correct answers, responses, or completed products. Raw scores are compared with one or more of the 19 available norm groups. Raw scores are then plotted onto a five-point scale ranging from Much Below Average to Much Above Average. These ratings are based upon percentile norms. Therefore, Micro-TOWER provides a profile of scores in the five major aptitude clusters.

If an evaluee scores in the upper range, the developers recommend further evaluation using more sophisticated work samples/tests. For those scoring in the lower ranges, other, more appropriate systems might be used for further evaluation, e.g., VIEWS, Vocational Transit, etc.

Micro-TOWER scores also lead to recommendations for job training or placement. Included in the Micro-TOWER General Manual are lists of jobs taken from the DOT. These jobs are classified according to the combination of the aptitudes required for satisfactory performance on such jobs. For example, the clusters of Motor Skills, General Learning Ability (from work samples measuring verbal, numerical, and spatial abilities), and Clerical Ability are combined and jobs subsequently identified which require these skills. Such scores can then be used to suggest specific jobs that are listed in the DOT. A table for this process can be found in the Technical Manual.

Reporting Micro-TOWER results is relatively simple. An answer sheet and a score sheet are provided for each of the thirteen work samples. In addition, there are general report forms covering behavioral observations. These provide a structure for organizing observations for inclusion in the final report. The final Micro-TOWER report contains behavior ratings, a summary, and final vocational recommendations in a narrative format. The final report format and a sample report are given in the work sample manual.

IV. Measurement Properties

Norm Groups: Micro-TOWER has followed proper standardization procedures and the 19 available norms are admirable. Most norm groups contain sufficiently large numbers. Standard error of measurement is given for each sample.

Reliability: Reliability studies include test-retest, alternate forms and tests for internal consistency. Reported correlation coefficients for reliability range from a low of .74 to an admirably high .97.

Validity: The construct validity of the work sample battery is supported by examination of the intercorrelations of the Micro-TOWER work samples" (Botterbusch, 1987, p. 88). Developers note that the Micro-TOWER samples also correlate well with counterpart scores of the General Aptitude Test Battery (GATB). No predictive validity studies were reported (Backman, 1977; Botterbusch, 1987).

V. Summary and Review

The group approach to measuring vocational aptitudes provided by Micro-TOWER is an interesting and novel one. There is substantial client involvement, and the fact that one evaluator can work with 10 clients would seem cost effective. The fact that it can be both a preliminary screening device and an evaluation system makes it versatile. Like all systems using the Labor Department's Worker Trait Group Arrangement and aptitudes from the 1965 DOT, the foundation for the Micro-TOWER's aptitude classification is somewhat dated.

Micro-TOWER is low-tech. This could be considered either a blessing or a curse depending upon one's perspective. The reasonable price may be one of the results of its no frills approach. Computer-assisted scoring and job matching, however, could possibly improve the efficiency of Micro-TOWER. Micro-TOWER also appears to suffer from insufficient marketing and may not enjoy the widespread use that it perhaps deserves when it is compared with its competitors. While the number of norm groups is impressive and reliability shows stable consistency, additional predictive validity studies would certainly enhance its measurement properties and thus its utility.

Skills Assessment Module (SAM)

Precis

The Skills Assessment Module (SAM) is an assessment system that targets mildly handicapped and disadvantaged youth between the ages of 14 and 18 and is designed to assess 25 affective, cognitive, and psychomotor abilities in relation to local vocational training programs. The system is developed by Piney Mountain Press, Inc., P.O. Box 333, Cleveland, GA 30528, phone number 800-255-3127. The cost of the system is $1,995.

I. Description

SAM is packaged in a wooden box containing a manual, a technical guide, three paper-pencil tests, 12 hands-on work samples, and a computer-based scoring and reporting system (available for both Apple and IBM). Most of the parts are made of wood, metal, and plastic. Expendable supplies are minimal and all may be reproduced with the exception of the Revised Beta Examination, a published, standardized non-verbal measure of intelligence.

The hands-on modules are designed to determine whether students have the ability to perform tasks related to vocational training programs found in most school systems, e.g., business education, cosmetology, electronics, drafting, health, marketing. The paper-pencil tests include the administration of a learning styles inventory (the Learning Styles Media Kit based on the C.I.T.E. Learning Styles Instrument developed by Babich, Burdine, Allbright and Randol at the Wichita Public Schools), the Revised Beta Examination, and the auditory directions screen (oral directions).

II. Administration

The system was designed to be used by special needs educators, but those with a background in evaluation should have no difficulty with SAM administration. No specific training in the use of the system is required prior to purchase. Prior to administration the following data should be collected and noted on the Data/Reporting Profile form provided: special education data, interview data, input from parents and previous instructors, any interest or achievement test results, grade averages, IQ tests, attendance and discipline reports from permanent school records.

The student should be given an orientation as to the purpose and scope of the assessment. Instructions are given orally and by demonstration and may be given more than one time. Allowances are made for modifications to accommodate student needs. The paper-pencil tests are administered first in either a group or individual format. The work samples are independent and can be administered in any order over any time period desired. The setting should be in a well-lighted classroom or lab with work performed on any flat surface. The entire system can be administered in 2-1/2 to 3-1/2 hours.

The manual provides detailed instructions should the need for readministration of any of the modules arise. Included are methods of readministration, conversion tables and standard error of measurement, and interpretation of readministration results.

III. Scoring, Interpreting, and Reporting

Scoring can be accomplished by hand or by using the software provided with the system. Scores from the paper-pencil tests are entered onto the Data/Reporting/Profile Form provided. Each of the 12 modules is scored based on time and error and converted using either MTM standards (for time only) or to percentiles using one of the norm groups provided. A total performance score for each of the 12 modules can then be computed and converted to a 1 to 5 scale (superior, above average, average, below average, needs improvement).

Scores can then be entered on the Vocational Performance Matrix designed to show the relationship between the student's performance and the level of performance required in local vocational training programs. These training program ratings are derived from a vocational instructor, or one can use the ratings provided by the developer.

The scoring process and conversion of raw scores is greatly simplified by using the software provided. Hand-scoring procedures are clearly explained with step-by-step instructions.

IV. Measurement Properties

Norm Groups: Three separate sets of norms are available: 1) average vocational students; 2) mildly handicapped students; and 3) disadvantaged students. All groups are from the state of Georgia and include approximately even numbers of male and female with an age range of 14-18 in grades 9-12. Means, standard deviations, and percentiles are provided on all groups.

Reliability: Test-retest reliability coefficients were established with average students (N=50) using the Pearson r statistic. Subtest coefficients ranged from .80 to .95.

Validity: Content validity is reported as a relationship between skills measured by the various samples and the competencies needed for various vocational training programs. Methods for establishing the validity and reliability of vocational training programs based on instructor ratings are currently being studied.

MTM-1 predetermined standards for time have been computed on 11 of the subtests in an effort to establish criterion-related validity. A second criteria involved the use of grades and behavioral ratings to select students for inclusion in the average norm group.

Standard Error of Measurement (SEM): A SEM for time is computed for each of the samples with the exception of Color Sort. It is suggested that these scores be used in conjunction with "cut scores" when making decisions related to acceptance/rejection into vocational training programs.

V. Summary and Review

The developers of the SAM are to be applauded in their efforts to develop a system which assists school systems in selecting appropriate vocational training programs for secondary special needs students. This curriculum based assessment model is in keeping with the current transition from school-to-work philosophy. The developers report performance ratings for a number of vocational training areas established by vocational instructors at various pilot sites. Purchasers of the system would be encouraged to generate performance standards for their local vocational training programs.

Norms have been generated from urban, rural, and suburban areas but all in Georgia. While MTM standards can be considered as global in their applicability, users of the system are encouraged to develop their own local norms using a computer assisted local norm development system available for that purpose. The ultimate measure of any instrument lies in its ability to predict. The developers are encouraged to generate empirical evidence equating subject performance on the system modules to outcome, i.e., performance in various vocational training programs or job placements.

System for Assessment and Group Evaluation (SAGE)

Precis

The SAGE system targets junior high, secondary, and postsecondary students and the disadvantaged. The developer reports that the system can be used with the borderline mentally retarded and with persons with other disabilities with some modification. A total of 17 tests/instruments representing five components are administered to generate a Worker Trait Profile for each client tested. The system is presently distributed by the Train-Ease Corporation, PESCO, 21 Paulding Street, Pleasantville, NY 10570, phone number 800-431-2016. The system is presently priced at $7,995.

I. Description

The system consists of 17 tests grouped as follows:

- Vocational Assessment Battery (VAB) measures the 11 U.S. Department of Labor aptitudes (general; verbal; numerical; spatial, form, and clerical perception; motor and eye-hand-foot coordination; finger and manual dexterity; and color discrimination);
- Cognitive and Conceptual Abilities Test (C-CAT) which measures the General Educational Development components of reasoning, math, and language;
- Vocational Interest Inventory (VII) which measures the interest areas found in the Guide for Occupational Exploration. Reading level does not exceed the fourth grade;
- Assessment of Work Attitudes (AWA) was designed to "reflect beliefs, thoughts, feelings, values and action which employers and tests in the literature commonly interpreted as attitudes." Vocabulary used in the AWA does not exceed the fourth grade; and
- Temperament Factor Assessment Unit using a true-false format to measure ten Department of Labor temperaments.

The manual contains information describing each of the above components, the development and rationale, administration instructions, and scoring procedures. Forms, interpretive information, definitions of terms, and various reference manuals are also included. The manual is logically arranged and easy to follow.

Excluding the paper-pencil tests, the system is made of hard plastic which seems quite durable. In the event that the user should experience problems with any of the electronic test instruments, a toll free number is provided for assistance. There are some consumable supplies which can be duplicated or purchased locally. Users are advised to contact the developer prior to making local purchases so as to be certain that any materials purchased would not jeopardize the system's standardization. Upkeep and maintenance should be minimal.

II. Administration

One evaluator familiar with the system should be able to assess six persons at one time comfortably. More subjects than this would make accurate observation and recording of client behaviors difficult. No specialized training is required to administer the SAGE, but a one-day on-site training is available.

Administration procedures are clearly identified in the manual. An Observation Record to rate a number of behaviors grouped into one of six broad factors using a four-point rating scale is provided for this purpose. Clients with sufficient reading levels can self-administer some of the tests while other tests must be demonstrated by the evaluator. Practice exercises precede the VAB and the C-CAT. The entire system can be administered in 4 to 5 hours.

Specific times are allowed for the tests in the C-CAT and the units of the VAB and are timed by the evaluator. Two of the VAB units have built-in timers. Interest, temperament, and work attitude assessments are not timed. Tests within the system can be administered in any order.

III. Scoring, Interpreting, and Reporting

The Assessment of Work Attitudes (AWA) is scored on a 1 to 4 scale. The resulting totals are converted to one of the three categories: job ready, "?", and doubtful.

The Vocational Interest Inventory (VII) computes the total number of statements considered of interest by the subject in each of the GOE interest areas and compares them to a cutoff determined by the developer. For example, the subject must have selected at least 75% of the interest statements in a particular interest content domain before this area would be considered as appropriate for the subject.

The C-CAT is scored by totaling the number of correct responses which are then converted to a 1 to 6 GED scale developed by the U.S. Department of Labor.

The VAB is also scored based on the total number of correct responses which are then converted to the 1 to 5 scale developed by the U.S. Department of Labor.

The Test of Temperaments is in a true-false format with the end result providing information as to which of the ten factors an individual possesses an inclination. All test results including information from the Observation Record are recorded on the SAGE Profile Form which is easily understood and consists of 1) a cover page allowing entry of information regarding physical capabilities and further recommendations (additional evaluation, training program placement, job placement, comments); 2) a Raw Score Conversion Profile; 3) an Occupational Match Form (allowing the evaluator to compare the client profile with profiles of other jobs); and 4) an Observation Record (rating 19 behaviors on a four-point scale of unsatisfactory, marginal, average, and superior).

IV. Measurement Properties

Norm Groups: The Manual of Research and Norm Studies (PESCO, 1988) identifies the following norm groups: psychological handicapped, mixed disabilities, physically handicapped, learning disabled, mentally handicapped, low IQ high school students, vocational technical high school students, industrial workers, normal functioning adults, and total group. Raw score distributions for each of these populations are presented in chart form allowing system users to convert subject scores to standard scores, z scores and/or percentile scores.

Reliability: Internal consistency of each of the non-manipulative subtests of the VAB were computed using the KR-20 formula. Test-retest coefficients were computed for the manipulative tests, clerical matching, and for color discrimination. Most of these coefficients were in the acceptable range.

Validity: Construct, content, and criterion validity of the VAB were examined. Coefficients ranged from quite low when compared with descriptive variables to moderately high when compared to other test instruments (GATB, VALPAR, Aptitude Check List).

V. Summary and Review

The SAGE is a comprehensive system designed to assess each of the eleven aptitudes and three General Educational Development (GED) components of the Department of Labor worker trait profile. Scores are reported in the DOL format (1 to 5 on aptitudes and 1 to 6 on GED) which allows for ease in interpretation, assuming one is familiar with this system. These results can then be used in the JOBS-II computer job search program to identify occupations that might be considered for the subject. Materials are provided to conduct the same job search procedure by hand if one does not have the computer capability. The system is sufficiently portable to allow its use in mobile evaluation programs.

Systematic Approach to Vocational Evaluation (SAVE)

Precis

The Systematic Approach to Vocational Evaluation (SAVE) is based on the Worker Trait Group concept from Volume II of the 1965 Edition of the Dictionary of Occupational Titles. Package A was designed to assess those with low academic abilities, the educable mentally retarded, culturally disadvantaged, the learning disabled, and the trainable mentally retarded in 16 different worker trait groups. SAVE Package B has expanded the number of worker trait groups assessed to 46 and includes the original 16 found in Package A.

Either system is available from SAVE Enterprises, 16 Downing Street, Rome, GA 30161, phone number (706) 295-6407. Package A is priced at $325, Package B at $825.00.

I. Description

The SAVE system uses the Qualifications Profile of Worker Trait Groups (WTG) found in Volume II of the 1965 edition of the DOT. All 114 WTGs were analyzed by GED and Aptitude levels. WTGs containing GED levels of 1 through 4 and "averaged" Aptitude levels of 3, 4, and 5 were selected for inclusion in the system. Using this process, 46 worker trait groups were identified. Each of these groups is described in narrative form and includes the Work Performed, Interests, Temperaments, and Specific Vocational Preparation.

The developers state that field testing in the state of Georgia identified 16 of the 46 worker trait groups as being more appropriate for the mentally retarded and academically deprived. These 16 became the basis for the SAVE Package A. An additional 30 WTGs plus these 16 combine to create SAVE Package B.

The system also includes a rating form and a procedure to determine client physical capacity. The rating is based on the physical demands criteria of the DOT (lifting capacity, reach/handle, climb/balance, etc.). The system uses six physical demands categories and not the expanded 20 categories.

Forty-seven work samples were developed to measure the worker requirements from each of the selected WTGs. These work samples are used in various combinations to measure an evaluee's aptitude in a particular group, e.g., work samples 1, 2, 3, and 48 are used to measure work requirements for WTG 1, Information Gathering, Dispensing, Verifying, and Related Work.

Although no equipment or tools are furnished with SAVE, most of the necessary materials are available in schools and rehabilitation facilities. The developers provide a list of the equipment needed to administer all the work samples.

The developers indicate that the average subject can be evaluated in fifteen to twenty hours. An individual experienced in the administration of the system should be able to test up to five persons at a time.

The manual provided by the developers is well organized and easy to follow. Sections include information on the philosophy behind the development of the system, evaluator instructions for each of the work samples, work sample operation sheets, an equipment list, norms and validity, DOT reference material, and order blanks.

II. Administration

Although not required to administer the system, formal on-site training by the developers is available upon request of the purchaser. Such training is provided on a per day plus expenses basis.

The first step in administration is to explain the SAVE evaluation concept to the evaluee. Next, a standard achievement test should be administered to establish academic functioning level (the developers recommend the Wide Range Achievement Test). The Worker Trait Group Screening which allows the subjects to select worker trait groups in which they would like to be evaluated is then presented. For non-readers, the descriptions of each worker trait group--which includes work performed, vocational preparation, interests, and temperaments--can be put on audio tape. Selection of certain worker trait groups serves to identify which specific work samples will be administered. The six sections of the physical capacity rating are completed next. The evaluator must then determine whether the subject's physical capacities meet or exceed the weight requirements for a worker trait group prior to its administration. Work samples relating to each of the subject selected worker trait groups are then administered following the instructions provided.

At the completion of work sample administration, the subject is rated as either Acceptable (A) or Not Acceptable (N) on 31 observed work behaviors, e.g., Reliability, Neat Appearance, Willingness to Follow Instructions. Each of the behaviors includes accompanying criteria that the developers recommend using in order to objectify ratings.

Forms are provided for recording worker trait groups of interest to subjects, physical capacities rating, performance in each work sample within worker trait groups, and behavior observations ratings.

III. Scoring, Interpreting, and Reporting

Performance on each work sample is scored as Acceptable (A) or Not Acceptable (N) based on time to complete and errors. Once all work samples within a worker trait group have been administered, the evaluator must arrive at a mean score for that group. As an example, assume a subject has taken work samples 3, 31, 2, 7, and 14 representing WTG "Computing and Related Recording" with ratings of A, N, A, A, and A, respectively. To earn a mean score of Acceptable for this WTG, more than half of the samples must be rated (A). Performance for the WTG is considered Not Acceptable when half or more of the samples are rated (N). Using this example, the subject's performance would have been considered Acceptable for this WTG. The evaluation is complete when work samples within all Worker Trait Groups have been administered and rated.

The evaluator then refers to the manual and identifies the WTGs in which the subject's performance was rated as Acceptable. Each WTG includes a list of occupations which, according to the logic of the system, could be potential jobs for the evaluee. It is the responsibility of the evaluator to review each occupation for feasibility and availability and to assure that the physical demands of the job do not exceed the abilities of the evaluee. Occupations are reported using the six-digit DOT code number, but a conversion to the 1977 Fourth Edition DOT nine-digit coding system can be accomplished using the Conversion Table of Code and Title Changes, Third to Fourth Edition DOT available from the developers.

A report format is provided which includes sections for subject identifying information, services rendered, WTGs chosen by the subject, physical capacity rating, academic functioning level, prognosis regarding competitive employment, and conclusions and recommendations.

IV. Measurement Properties

Norm Groups: The manual reports two sets of norms for each work sample: mentally and physically handicapped norms (clients served in several rehabilitation facilities in a southeastern state) and industrial norms (no descriptive data available). While subject performance can be compared to both groups, the developers suggest the industrial norms be used as a "benchmark" or goal to use to determine realistic vocational expectations.

Reliability: One brief validity study is reported. A random sample of 20% of persons evaluated using the system was identified. Follow-up of this sample found that 75% were successfully employed in Worker Trait Groups recommended as a result of their assessment using the system.

Validity: No mention is made regarding the validity of the system.

V. Summary and Review

The SAVE system could be described as a collection of standardized tests (IQ, achievement, and color discrimination) and developer constructed tests measuring the aptitudes identified as critical to successful performance in each of 46 of the Department of Labor's original 114 Worker Trait Groups (WTG). The WTG concept of the Department of Labor (DOL) dates back to the Third Edition of the Dictionary of Occupational Titles (1965). Though the developers adequately explain this concept in their manual, it is most likely foreign to many conducting evaluations today.

The developers have failed to provide statistical evidence supporting their system. While mention is made of two norm groups, no demographic data is provided that describes the characteristics of these groups. Additionally, persons interested in the system are asked to accept on faith that the tests constructed by the developers do, in fact, measure the aptitudes they purport to measure. No content, construct, or concurrent data exist to establish the validity of the measures used. The developers' claim of predictive validity based on one study is also of questionable utility unless other studies are conducted that replicate these findings.

Talent Assessment Program (TAP)

Precis

The Talent Assessment Program (TAP) is a compact, durable battery of ten hands-on tests which has been in use for some 15 years. According to the developer, the TAP is a "proven system for measuring an individual's functional vocational aptitudes." Printed material describing the system indicates its utility for virtually any population including nonreaders and readers, English-speaking and non-English speaking, the functionally illiterate, handicapped and non-handicapped and the learning disadvantaged. Presently the system is being used in a variety of settings including school-to-work transition programs, rehabilitation facility programs, and private rehabilitation programs.

TAP is available from Talent Assessment, Inc., P.O. Box 5087, Jacksonville, FL 32247, phone number (904) 260-4102 at a cost of $5,590.

I. Description

The complete TAP package consists of ten hands-on tests, portable carrying cases, and computer scoring package. The ten tests contained in the system can be grouped into the following broad categories: **Visualization and Retention** (Test 1--Form and Spatial Perception, Test 9--Ability to Follow Flow Patterns, and Test 10--Retention of Form and Spatial Details); **Discrimination** (Test 2--Fine Discrimination, Test 3--Color Discrimination, and Test 4--Tactile Discrimination); and **Dexterity** (Test 5--Fine Motor Control, Test 6--Manual Dexterity, Test 7--Quality Performance, and Test 8--Ability to Use Large Tools).

II. Administration

The evaluation procedure using the system is fairly straight-forward. All ten tests are administered to an evaluee in 2 to 2-1/2 hours following procedures clearly outlined in the manual. Instructions are given orally and by demonstration. The objective is to make certain that the subject completely understands the tasks. Test 1 must be administered first and Test 10 must be administered last. Tests 2 through 9 can be administered in any order. These test results can then be entered into the accompanying computer program for analysis. The subject's performance on the ten tasks leads to the development of a client profile which can then be compared to specific job requirement profiles for jobs identified in the Dictionary of Occupational Titles, work groups of the Guide for Occupational Exploration, and occupational data of the Department of Labor. Jobs are selected based on a match between the subject's test performance and job requirements for 500 core jobs identified by the Department of Labor. This job search feature allows the user to include additional client data generated from other sources such as Physical Demands (lifting capacity, climbing and/or balancing, etc.), Working Conditions (indoor/outdoor, cold, heat, etc.), Math ability, Language ability, and Specific Vocational Preparation (SVP). It should be noted that in the Revised Handbook for Analyzing Jobs (U.S. Department of Labor, 1991) the Physical Demands have recently been expanded from 6 to 20 and the Working Conditions from 7 to 14. These changes have not, as yet, been incorporated into the TAP.

III. Scoring, Interpreting, and Reporting

Scoring can be accomplished by hand or by using the software provided. The printout generated by the software first presents biographical data on the client tested. Next, each of the ten

TAP tests are described in terms of what they measure. Following this description, a bar graph is displayed depicting client performance on each of the ten tests. Next, time (in minutes) and percentile scores for each of the tests are displayed in table form. Interpretation then follows, outlining client aptitudes which could be considered as strengths. This information is then converted to a client profile and compared to the profiles of jobs found in the database. This procedure results in the identification of matches between client aptitudes and job requirements. The programs to score and operate the job matching system require a minimum of 64K RAM, a monitor, one disk drive, and a printer.

IV. Measurement Properties

Norm Groups: Subject scores can be compared to junior high, adult, and mentally handicapped norm groups and reported as percentile rankings for each of the ten subtests. Specific information describing the demographic characteristics of these groups was not available to the reviewer.

Reliability: One reliability study using the test-retest method after a six month interval resulted in a reliability coefficient of .86 for the entire battery. No other reliability data are available.

Validity: No evidence of construct, concurrent, or predictive validity was available.

V. Summary and Review

The Talent Assessment Program consists of ten standardized tasks which measure abilities required by a number of occupations. The logic of matching a subject's tested abilities to job requirements is a strategy dating back to the turn of the century and is common to many commercially available assessment batteries.

The durability and portability of the system are certainly positive features as are the 1-1/2 days of on-site training included in the initial purchase cost, the 1-800 support number, and free updates for the first year.

Criterion referencing of the test results to Department of Labor resources is also to be commended. There is concern, however, over the general lack of data to support the existence of the system's reliability and validity. One would certainly expect to find more than one test-retest reliability study on a system which has been in used for well over a decade.

Regarding the question of validity, the user is simply asked to take the developer's word that the ten tests are measuring what they purport to measure. The argument that the system would not have been used for such a long period unless it were valid is simply inadequate. There exist any number of standardized tests which measure color discrimination, fine dexterity, gross dexterity, spatial perception, form perception, and tactile discrimination which could be used to validate concurrently a majority of the subtests within the TAP battery. It would also seem that sufficient numbers of persons would have been evaluated with the battery over the years to allow for at least one predictive validity study.

The developer notes that the system is best used to identify client potential within "work clusters" therefore making it difficult to establish predictive validity in relation to specific occupations. The software program which accompanies the system, however, enables the user to compare individual client test results to a data bank of 500 specific job titles and not work clusters. This raises a question concerning how the identification of these specific occupations might be used in light of the fact that no data exists showing a relationship between the jobs identified and client outcomes.

VALPAR Component Assessment Systems

Precis

VALPAR currently consists of 19 self-contained work sample/activity units designed to assist in evaluating career potential in jobs and job classifications described in the U.S. Labor Department's 1990 Dictionary of Occupational Titles and its related publications. VALPAR is useful for most disability groups and appropriate for non-disabled individuals. Adaptations are available for those with sensory impairments. Each work sample corresponds to one or more of the 27 subfactors of the Worker Qualification Profile (WQP) so the sample can suggest appropriate worker trait groups as well as specific job possibilities (Botterbusch, 1987; Swartz & Christopherson, 1991).

Individual units are sold separately, and the price varies considerably. The original 16 units sell together for a total of $25,375. Unit prices in the 2000 Series range from $595 to a high of $995. Other unit prices range from a low of $1,245 (for #2 & #3) to a high of $2,699 (for unit 14). A complete 201 to 205 set can be purchased for $3,499. Contact: VALPAR International Corporation, P.O. Box 5767, Tucson, Arizona 85703-5767, phone 602-293-1510. The Customer Service Department may be reached toll free: 800-528-7070.

I. Description

VALPAR is not a single, interlocking system but rather a series of 19 separate units designed to be administered, scored, and interpreted independently of the other units. The revised manuals, however, feature a Worker's Qualification Worksheet that encourages merging of top scores on the various units in order to compile an overall Worker Qualification Profile (Swartz & Christopherson, 1992).

All units are constructed of durable particle board covered with new, blue laminate that requires little or no maintenance. The newly revised manuals are well organized, comprehensive, and professional in appearance. Novel activities required in each VALPAR unit generally holds the interest of the individual being evaluated (Wright, 1980). Most VALPAR units are indeed work samples, but some focus on other activities. This can be discerned from Table 1 on the following page listing the 19 VALPAR components and the corresponding Worker Function number (found after the brief description of each job-related and companion VALPAR unit). Worker Functions, found in the Handbook for Analyzing Jobs (Materials Development Center, 1982), classify jobs according to the job's relation to data, people, and things.

II. Administration

Each VALPAR manual clearly describes the method, sequence, and procedures needed for administering individual components. One evaluator should not work with more than 3 or 4 individuals at one time. Preliminary screening of the individual in terms of reading level and general educational development is encouraged prior to administering the VALPAR units. Since each unit is self-contained, the order of administration of component samples is unimportant. Standardized directions are printed and most directions are given orally. Demonstrations are permitted to assure understanding of proper procedures. A few component samples require reading written directions (#5 clerical, #13 money handling, #16 drafting).

Practice sessions are permitted on most units, and demonstrations are given whenever a practice session is not required. In some cases the manuals encourage two or three practice sessions and the samples may be repeated at a later time. A real plus is that each sample recycles

Table 1. VALPAR Components and Corresponding Worker Function Numbers

Component Number	Description Number (DPT)	Worker Function
1	Small Tools - (mechanical) - Measures individual's use of small hand tools.	.682-
2	Size Discrimination - Determines an individual's ability to discriminate various sizes by evaluating the size of various nuts and affixing them to their corresponding bolts mounted to a horizontal platform.	.686-
3	Numerical Sorting - Appraises individual's ability to sort by number and number series. Also appropriate for assessment of work attitudes and may be used in work hardening.	.584-
4	Upper Extremity Range of Motion - Assists in determination of physical capacity by placing nuts onto bolts affixed inside a box from a variety of angles.	.686-
5	Clerical Comprehension and Aptitude - Measures an individual's ability to perform basic clerical tasks.	.383- .567- .582- .687-
6	Problem Solving - An abstract measure of problem solving ability.	.281-
7	Multilevel Sorting - Measures ability to sort by a combination of numbers, letters, and colors.	.687-
8	Simulated Assembly - Determines finger and manual dexterity in performing a repetitive task.	.686-
9	Whole Body Range of Motion - Assesses gross body movements of trunk, arms, hands, fingers, and legs.	.686-
10	Tri-Level Measurement - Assesses ability to inspect and measure at various levels from the simple to a more precise, complex level.	.281-
11	Eye-Hand-Foot Coordination - Measures ability to simultaneously use eyes, hands, and feet in a coordinated manner.	.683-
12	Soldering and Inspecting - Evaluates one's ability to solder tasks of varying difficulty.	.382- .681-
13	Money Handling - Assess individual's understanding of money concepts and consumer economics.	.482- .487-
14	Integrated Peer Performance - Appraises ability to work in groups in performing group assembly and inspection tasks.	.364- .666-
15	Electric Circuitry and Print Reading - Measures individual's understanding of electric circuitry and ability to read diagrams.	.281- .684-
16	Drafting - Reveals potential for drafting and blueprint reading.	.281- .384- .584- .587-
17	Pre-Vocational Readiness Battery - A group of subtests assesses the functional skills of those who are mentally retarded in five areas including: developmental, work skills, interest screening, interpersonal skills (social), and independent living skills. VALPAR #17 is not a work sample and actually may be considered a separate evaluation system (Botterbusch, 1987, p. 107-112).	
18	Conceptual Understanding Through Blind Evaluation (CUBE) - Surveys coping skills, mobility, judgment, orientation, and balance for those who have severe visual impairments (not really a work sample).	
19	Dynamic Physical Capacity - Not a work sample but measures physical demands as defined by U.S. Labor Department Publications (Botterbusch, 1987).	

itself so the sample is ready for the next administration without additional preparation by the evaluator. Time required to take each component varies from 15 minutes for Independent Problem Solving (#6) to 90 minutes for Small Tools (#1). Several units are not timed. VALPAR #17, which is essentially a completely different system for those who are mentally retarded, requires up to a week or more to administer.

While VALPAR recommends a basic background in tests and measurement and encourages participation in company sponsored training in use of the components, VALPAR does not seem as adamant in requiring training as some of the other system developers.

Some VALPAR units are portable while others would have limited mobility. Private practitioners and evaluators serving multiple schools via automobile would have difficulty transporting sufficient numbers of VALPAR components to assure adequate coverage of occupational groups. Most components could, however, fit compactly into mobile evaluation units. Space needed for the components would naturally depend upon the number of units desired. VALPAR component work samples do not use computers in any of the 19 units.

III. Scoring, Interpreting, and Reporting

Scores are derived from the time needed by an individual to complete the component sample and/or the errors recorded in the process. Score sheets and scoring procedures are illustrated clearly in the manuals. The new VALPAR manuals continue to permit comparison of an individual's time/error score with one or more of the 11 norm groups established earlier. Because procedural changes allow for several practice repetitions in some units, a few norm group comparisons are no longer viable. Developers did not bother to develop new norms for these affected components but have issued warnings that some norms are no longer appropriate.

Slight revisions in administration of other components supposedly are so minor that there have been no adverse effects in standardization and thus would not impact upon the norms (Christopher, 1991; VALPAR, 1991).

VALPAR has seemingly moved away from norm group comparisons toward greater use of criterion measures such as the previously available Methods-Time-Measurement (MTM) comparisons. MTM permits the individual being tested to compare his/her performance with that of an experienced worker in the specific work field being considered.

VALPAR has added a new twist in its criterion standard scoring with the addition of the Worker Qualification Profile (WQP). To be successful on any work sample, an individual must achieve an MTM standard of 87.5% and commit no more than the allowable number of errors. This success equates to average or better performance on each of the factors measured by the particular work sample. Factors found in the qualification profile have been taken from the Handbook for Analyzing Jobs, (HAJ) e.g., General Education Development, Aptitudes, Physical Demands, etc. The individual's best score on each factor is then compared with that of the highest possible level on each factor on the Qualification Profile worksheet. Such comparisons with the HAJ criterion standard permits further conjecture as to an individual's potential in learning to perform jobs in a particular occupational group.

In summary, an individual's VALPAR performance score on each component will be compared with available norms, the MTM standard, or the new Worker Qualification Profile. The score is then interpreted in terms of an individual's potential to perform jobs in the occupational group in question. Since the VALPAR samples are free-standing, self-contained units, no recommendation is made for reporting results in any particular way. Scoring sheets are available for each unit, and body position charts are available for the three components related to physical capacity assessment (numbers 4, 9, 19).

IV. Measurement Properties

Norm Groups: Norms for most VALPAR components have been developed separately and include 11 different norm groups ranging from Air Force personnel, employed workers, to groups of individuals who are blind and deaf. VALPAR encourages the development of local norms.

Reliability: To their credit, VALPAR has engaged in a number of studies of reliability and validity. Reliability studies reported in VALPAR manuals of test-retest variety indicate consistently high reliability. Standard error of measurement is also reported.

Validity: An admirable number of concurrent validity studies are reported for each component for both time and error scores. Although correlations are not impressively high, many were found to relate significantly (both divergently and convergently) to such standard tests as the Wechsler Scales, several dexterity tests, and a number of interest inventories and achievement tests. VALPAR's work in deriving MTM standards for its component work samples is a major strength. Thus, VALPAR is to be commended for its attention to norms, standard error of measurement, reliability and validity, and MTM criterion referenced standards.

V. Summary and Review

Since it was first developed by a group of University of Arizona faculty and students in the early seventies, the VALPAR Component Work Sample System has proven popular with practitioners. The new color, newly revised manuals, and the new Qualifications Profile feature tied to MTM indicate that VALPAR continues to refine and develop its popular system. Since procedures for administering (practice) some of the units have basically invalidated norms for those samples, consideration should be given to developing new norms for those components.

When used with other evaluation techniques, the VALPAR components can be useful in the vocational evaluation of those with disability and even for those without disability. VALPAR is also to be commended for addressing the needs of those charged with the vocational assessment and evaluation of individuals with sensory impairments and mental retardation. Most VALPAR components would be an added strength to any vocational evaluation setting.

Vocational Evaluation Systems (VES)

Precis

The VES consists of 28 independent, self-contained carrels. Although particularly interesting to and relevant for those of lower socio-economic backgrounds, the VES can be used by any disability group and by the non-disabled for vocational exploration, work hardening, and for vocational evaluation. Individuals complete job-related projects within each carrel which are subsequently graded for time required and errors committed. For instance, in the Plumbing and Pipe Fitting work sample (#5) the individual measures, cuts, and reams galvanized and plastic pipe, installs a P trap and water line, and repairs a faucet. In the Information Processing work sample (#28) the individual uses a personal computer, engages in letter and number matching activities, and posts information from business documents. Costs for each carrel range from about $1,700 to $4,700. All 28 carrels would cost approximately $70,000. Contact New Concepts Corporation, 2341 South Friebus Avenue, Suite #5, Tucson, AZ 85713, phone number 800-828-7876 or 602-323-6645.

I. Description

As an individual sits down at one of the 28 carrels containing a job sample he/she watches and listens to a taped/illustrated audiovisual presentation that briefly describes the jobs which may relate to the sample within the particular carrel (occupational information). Then, detailed directions for completing the work sample are given by the audiovisual. The carrels are sturdy, and all component parts appear durable. The following list of available work samples illustrates the wide variety of VES work samples and the attention given to the skilled trades:

1. Sample Making
2. Bench Assembly
3. Drafting
4. Electrical Wiring
5. Plumbing/Pipe Fitting
6. Woodworking
7. Refrigeration & Air Conditioning
8. Sales Processing
9. Needle Trades
10. Masonry
11. Sheet Metal
12. Cook & Baker
13. Engine Service
14. Medical Service
15. Cosmetology
16. Data Calculation
17. Production Machine Operation
18. Household & Industrial Wiring
19. Filing, Shipping, & Receiving
20. Packaging & Materials Handling
21. Electronics Assembly
22. Welding & Brazing
23. Office Services
24. Lab Technology Analysis
25. Diesel Engine
26. Auto Body Repair
27. Machine Trades
28. Information Processing

VES has four basic manuals and a manual for each work sample. These are comprehensive and are supplemented with the audio/video filmstrips and cassette recorders. Each unit has a variety of expendable supplies most of which could be purchased locally. Although one of the work samples contains a personal computer, there is no overall, integrated use of the computer for scoring, analyzing, or reporting. Due to the size of the carrels containing the work samples, mobility would not be an evident asset. Select samples, however, could be used in a mobile evaluation unit.

The basis for the VES samples is unique and not unlike that used for psychometric test construction. The procedures for developing a VES work sample include job analysis, task analysis, information gleaned from the DOT, and consulting with experts in a particular field.

Then critical, entry-level tasks related to a variety of jobs associated with the particular work field being sampled are identified and selected for inclusion in the sample.

II. Administration

VES makes available training opportunities for those desiring training, but no specific training requirements are published. VES does, however, point out the necessity of the evaluator, or others using VES, having a good foundation/knowledge in basic measurement statistics, Job Analysis, Job Classification systems, and use of the Dictionary of Occupational Titles. The individual undergoing VES evaluation requires no preliminary screening other than a basic orientation by the evaluator. Reading levels and disability type should be noted for the sensory impaired and for those who do not understand English well for they will need special accommodations due to the methods employed in giving directions. The audiovisual cassette recording and the film projector give introductory material and provide instructions for completing the work sample via linear programmed instruction. The audiovisual has pre-set intervals for asking for assistance and monitoring, and the evaluator is always on call for each evaluator handles only three to four individuals at one time. The client's involvement in the total process is one of the system's major strengths.

The average time required for each work sample is about two and one-half hours, although this varies considerably with each individual sample. There is no set sequence for administering the samples, but client interest or referral questions might suggest a starting point or a particular group of samples. Space needed for the VES is considerable if several samples are to be used. Some units require more space than others. Available space would be a major consideration in acquiring a number of VES work samples.

III. Scoring, Interpreting, and Reporting

The VES has client and employed worker industrial time norms for each work sample. All scoring is done by hand. VES has also determined the time required for an entry-level worker to complete the job sample via analysis, and a quality rating is available. Time and error scores are recorded for each work sample. Scores falling below standard time and error scores can reduce the percentage level of one's attaining the criterion standard provided by the MTM process. Final scores, therefore, are percentile scores in relation to the time norms and the percentage of attainment of the MTM standard. Some twenty aptitude and work factors are also assessed by VES.

Each sample comes complete with forms for task observation, work activity ratings, industrial norm ratings, MTM ratings, and a summary sheet for time and quality scores. Although no standard report format is given, recommendations are provided for topics which should be included in the final report.

IV. Measurement Properties

Norm Groups: Refinements in the VES over the past 20 years have rendered norms on (VES) work samples of 1973 or earlier vintage obsolete. To its credit, VES points this out, yet norms reported in the current manual are evidently not viable for a sizeable number of the 29 work samples.

Reliability: A single test-retest reliability study, completed in 1976, shows questionable levels of reliability ranging from .61 for time and composite scores and .71 for error scores.

Validity: Two 15-year-old predictive validity studies were reported indicating somewhat impressive results showing a high level of correlation between VES scores and employment and job placement in a work sample related area. Correlation coefficients ranging from .12 to +1 were reported. Botterbusch (1987), however, noted some methodological problems in these studies.

More impressive is VES's commitment to the use of MTM standards and consultant engineers in task analyzing its samples and in establishing criterion time standards. VES is also to be commended for a thorough discussion of measurement properties in its 1991 revision of its manual.

Another plus is the task frequency polygon. Available for each sample, it illustrates graphically that level tasks represented in the sample are actually included in the industrial jobs sampled.

V. Summary and Review

The VES, grandson of the Singer Evaluation System, has survived well since its development in the early seventies. It has been and continues to be used successfully in schools, institutions, and rehabilitation settings for hands-on occupational information and career exploration. Its continued upgrading and refinement indicate it can also be used for work hardening and vocational evaluation. It is user friendly, and most who engage the system's samples enjoy the tasks.

Many of the work samples result in a finished product, e.g., a ring, a wooden shelf, a cloth bag, brownies, etc. This format provides work sample tasks that resemble real jobs, and as a result there is usually high interest by the individual undergoing evaluation. Therefore, its content validity is a strength. Those engaging in the brick masonry sample know well that they are indeed mixing mortar and laying bricks. The job analysis and other activities used to select the tasks to be measured provide a user confidence in the task activities of the system.

The developers should also be commended for the MTM process in developing appropriate industrial criterion time standards for the samples. This should give an excellent indication of the individual's level of performance in reference to what would be expected in the real world of work. It could also be used as a measure of one's progress toward an acceptable performance following additional education, practice, or adjustment training.

Because many of the carrels involve several pieces of complex equipment, there may be a need for frequent repairs. Although each VES sample is well equipped with quality tools and equipment and the price for each individual sample does not appear exorbitant, purchasing a sufficient number of samples to cover a large portion of the career spectrum could be costly. Users should closely study their needs to assure that their selection of samples is a careful and considered decision based upon a needs study. VES should establish new norms for the older revised samples and should conduct additional reliability and validity studies with their samples.

Vocational Information and Evaluation Work Samples (VIEWS)

Precis

The VIEWS is a comprehensive, standardized evaluation system for persons who are mentally retarded. The tasks measured by the system are related to four (4) Worker/Skill Groups identified in the Dictionary of Occupational Titles (1965). These groups represent the four least skilled Data-People-Things categories.

The system was developed and copyrighted in 1977 by the Vocational Research Institute, a division of the Jewish Employment and Vocational Service, 1528 Walnut Street, Suite 1502, Philadelphia, PA 19102, phone number 800-874-5387. The cost of the system is $9,950.

I. Description

The system consists of 16 separate work samples packaged individually. These samples are grouped into one of four Worker Skill Groups: .687-Materials Sorting, Clerical Matching and Counting, and Assembling; .686-Machine Feeding; .685-Routine Tending; and .684-Fabricating.

An evaluator's handbook clearly describes the specifics of client orientation, demonstration and training procedures, set-up procedures for each sample, and norms for rating time and errors.

The system is durable and contains some expendable items which can be purchased locally. Upkeep and maintenance of the system would be minimal.

II. Administration

Individuals administering the system should thoroughly familiarize themselves with all phases of administration. There are no requirements for formal training. Prior to administering the system, individuals who are being tested are given an orientation by the evaluator which explains the tasks and purpose of the assessment and the procedures to be followed.

Each sample includes a standardized oral demonstration by the evaluator to the testee followed by a period of training to mastery. This training allows for unlimited assistance by the administrator to the testee to achieve mastery prior to beginning the production phase. The production phase requires the individual being tested to complete a prescribed number of cycles of the task independently. Assistance should be minimal at this time since the task has been learned and practiced. At the end of this production phase the sample is scored for time and errors.

Each work sample should be administered unless the individual has demonstrated, on a previous sample, an inability to perform the required task. The evaluator times each sample by using the time stamp provided. Time for administration will vary depending on the time required for mastery of the task and the time needed to complete the production phase. Estimated time would be between 15 and 20 hours.

Due to the nature of the population being evaluated and the time needed for training, an acceptable client to experienced evaluator ratio would be approximately 4:1.

III. Scoring, Interpreting, and Reporting

A three-point scale is used to score each sample on three measures of performance: trials to mastery, time required to complete the production phase, and number of errors made during production. This scale is based on the performance of the norming sample and corresponds to the upper third (3), the middle third (2), and the lower third (1). Scores can also be interpreted using predetermined industrial time standards, specifically the Modular Arrangement of Predetermined Time Standards (MODAPTS) system. This interpretation relates to a client's time performance only.

Scores and ratings for each sample are recorded on the VIEWS Client Record. A form for recording daily observations (physical appearance, communication, attendance, etc.) is also provided. The VIEWS Final Report Form provides an outline which includes general observations, interpersonal relations, training, worker characteristics, recommendations, and special comments.

IV. Measurement Properties

Norm Groups: The VIEWS samples were standardized on a broad sample of retarded citizens consisting of 104 persons between the ages of 16 and 61. Supplemental norms were generated in 1979 from 28 facilities throughout the United States.

Reliability: None reported.

Validity: None reported.

V. Summary and Review

The VIEWS was designed to meet the need for a standardized system to evaluate the mentally retarded and is based on the tasks which represent the lowest Data-People-Things categories from the DOT. A strength of the system is the requirement for training a subject to mastery prior to test administration thus enabling the evaluator to measure performance as a component separate from learning.

The inclusion of industrial time standards as a method of interpreting client performance is to be complimented. The failure, however, to provide data regarding the reliability or validity of the instrument some 15 years after its introduction is somewhat puzzling. Users are entitled to know if the system measures consistently and whether it can be used to make predictions with any degree of accuracy. Without evidence of reliability or validity, one knows neither.

Vocational Interest Temperament Aptitude System (VITAS)

Precis

The VITAS is designed for educationally and/or culturally disadvantaged persons of both sexes with less than a 12th grade education excluding the mentally retarded and physically disabled. The system originally related to 15 Worker Trait Groups of the Dictionary of Occupational Titles but has been updated to relate results to Work Groups from the Guide for Occupational Exploration (1979).

The system was developed and copyrighted in 1980 by the Vocational Research Institute, a division of the Jewish Employment and Vocational Service, 1528 Walnut Street, Suite 1502, Philadelphia, PA 19102, phone number (800)-874-5387. The basic system cost is $9,950.

I. Description

The system consists of 21 self-contained work samples that include all materials and supplies for administration. Using Volume II of the 1965 Dictionary of Occupational Titles, the work samples can be grouped into one of 15 Worker Trait Groups. A revised qualifications reference based on the 1979 Guide for Occupational Exploration classifies the samples into one of 16 four digit Work Groups (i.e., Laboratory Technology, 02.04).

The manual outlines an orientation process for new clients, general as well as standardized administration instructions, photographs of each sample depicting the standardized arrangement of materials, scoring procedures, definitions of aptitudes, instructions on completion of the evaluation report, and normative data.

There are some expendable items which should be ordered from the developer so as to maintain standardization. In general, the system is easily maintained and durable.

II. Administration

Though no formal training in the administration of the system is required, the evaluator should become thoroughly acquainted with the samples prior to administration. Prior to testing, clients are oriented to the evaluation process, the use of the time stamp machine (for timing each sample), approximate time to complete samples, and informed that behavioral observations will be recorded during the evaluation process.

The samples can be administered in any order unless otherwise instructed. Clients are provided instructions either verbally, by demonstration, or both prior to beginning the time sample. Instructions can be repeated, but no help or advice can be given during the performance phase of the work sample.

According to the developers, most clients can complete the system in 15 hours spread over several days. The maximum experienced evaluator to client ratio is 1:5 though it is recommended that "newly trained evaluators start with no more than two or three clients and increase to five as the evaluator becomes more experienced." The use of an aide to help score and disassemble the samples is also recommended.

III. Scoring, Interpreting, and Reporting

Performance on each of the samples is scored based on Total Time and Errors (type and frequency) and recorded on the Work Sample Record. These time and error scores are converted to numerical ratings corresponding to the upper third (3), middle third (2), and lower third (1) using the norm tables provided.

Information from the Work Samples Record and the Vocational Interest Interview is used to complete the Evaluation Report. This report contains an outline allowing the evaluator an opportunity to summarize the evaluation results. The final section allows the evaluator to recommend any of the Worker Trait Groups (WTG) for which the client qualifies based on test performance. To qualify for any of the WTGs, a client must earn a rating of 2 or 3 on both time and error for all the work samples that fall in that WTG. The client should also demonstrate an interest in and temperament for the kinds of work represented by that WTG.

IV. Measurement Properties

Norm Groups: 1980 norms are based on sample sizes which average 337 subjects per work sample. This sample is 37% male, 63% female, median age 25, 63% Caucasian, with educational levels of 8th grade or less = 8%; 9th = 8%; 10th = 21%; 11th = 12%; 12th = 35%; and beyond 12th = 16%. Secondary school norms from 1981 represent schools in New Jersey, Texas, and Georgia with a mean age of 15.2, mean grade of 8.7, 78% Caucasian, 12% Hispanic, 10% Black, and 68% male. Disabilities included learning disabled (67%), emotionally disabled (12%), multiply handicapped (9%), mentally retarded (7%), orthopedically impaired (3%), and sensory impaired and other (1%).

Reliability: No data available.

Validity: No data available.

V. Summary and Review

The end result of the VITAS evaluation allows the evaluator to compare a client's performance to Worker Trait Groups (WTGs) from the 1965 Dictionary of Occupational Titles or to any one of 16 Work Groups identified in the 1979 Guide for Occupational Exploration. How one might use the test data to then identify jobs within WTGs for which the client might qualify remains a mystery. Few persons have any familiarity with the 1965 DOT and even fewer have access to that document. The more logical use of tests results would be to identify Work Groups from the Guide for Occupational Exploration (GOE) for which the client might qualify and then use this information to access jobs listed in the GOE.

The lack of reliability and validity data is a weakness that needs to be addressed by the developer, especially in an era in which such empirical evidence is becoming more critical.

Vocational Transit

Precis

Vocational Transit is a new, computer-based evaluation system designed primarily for the developmentally disabled. Developers also report its usefulness in head injury rehabilitation. Its purpose is to evaluate individuals for some 800 simple, lower-level jobs requiring little specific vocational preparation and no more than lower elementary functioning levels. Thusly, the Vocational Transit measures only the four major aptitudes required for these limited jobs. Transit hardware consists of four electronic test modules, a control module, and accompanying paraphernalia. Software is contained on provided computer discs. A personal computer and printer are also needed for the Vocational Transit. Developed by Vocational Research Institute in 1989, the cost of the system is $5,850. If a personal computer is not already available, an additional cost for a computer would be required. There are also additional charges for shipment. Contact VRI at 1528 Walnut Street, Suite 1502, Philadelphia, PA 19102, phone 800-VRI-JEVS or 215-875-7387.

I. Description

Using the Labor Department's Work Group Arrangement classification system, from the 1979 Guide for Occupational Exploration, Vocational Transit developers identified lower level jobs requiring Worker Functions (Data, People, Things) that involve: comparing data; taking instructions from and helping people; and tending, handling, and feeding-offbearing relationships to things. Transit developers have further delimited jobs by using only jobs with the Labor Department's General Educational Development (GED) Level one (first through third grade) and requiring no more than a month of specific vocational preparation (SVP 1 and 2). Developers discovered that only Labor Department aptitudes of (K) motor coordination, (M) manual dexterity, (F) finger dexterity, and (P) form perception were critical aptitudes in the 800 unskilled jobs selected by this process.

The resulting Vocational Transit therefore consists of four separate modules that evaluate for these four aptitudes. For example, in the two activities assessing finger dexterity, pegs are moved from the top portion of a board to the bottom. Then spacers are placed on rivets as they are moved from the top to the bottom portion of the same board. In the form perception test, items are presented to the individual in a book sized flip chart; the individual being tested selects his choice from four alternative options, and the evaluator then records the answer using a keypad. Transparencies are another feature of the form perception test.

The system is packaged neatly in a portable, padded case consisting of test apparatus, form perception test booklet, and a three-ringed binder containing the Transit handbook and software discs. All Vocational Transit test apparatus must be connected to an IBM or IBM compatible personal computer (not included). A printer (not included) is also a necessity. The system's case is hard plastic; since the testing apparatus is made from heavy metal, both should prove durable.

II. Administration

A one-day training program for evaluators is provided by VRI and is strongly recommended. Individuals taking the Vocational Transit are generally low functioning individuals and require no pre-screening prior to testing. A 1:1 evaluator-client ratio is mandatory. The system takes about 90 minutes to administer, but testing activities should be planned so the individual does not have to complete all tests in one sitting. Test sequencing is from the simple to the more difficult. One begins with Motor Coordination, proceeds to Manual and Finger Dexterity and finishes with Form

Perception. A small table is all that is needed for administration of the Transit. The client is involved in moving pegs, making choices, and in interacting with the apparatus, but there are no provisions for vocational exploration. Directions are given orally and verbatim from the manual. Demonstration and practice sessions are encouraged, and multiple prompting levels are advised to assure the individual's understanding of the instructions.

III. Scoring, Interpreting, and Reporting

All scoring is done by the computer which registers testing times and error scores. The number of correct responses (raw scores) are converted into percentile scores for the three available norm groups (Developmentally Delayed, Non-Impaired Adults, Non-Impaired Secondary Students). Aptitude results are also reported according to the Labor Department's 5-point rating system. The computer provides a list of unskilled jobs within the capability of the individual as determined by the four aptitudes tested.

The Vocational Transit system is capable of several computer generated report formats. The evaluator can add demographic data, observations, physical capacity, and environmental tolerances to the standard computer program format thereby creating a more individualized report. The aptitude scores, physical capacities, and environmental conditions are correlated. This computer data analysis results in job recommendations from the Transit list of 800 unskilled jobs. Such jobs are classified by GOE groups, DOT titles and codes and provide information regarding SVP, Environmental Conditions, and needed Physical Capacities. The computer software, therefore, does the scoring, analysis, and interpretation in the form of job recommendations and can even provide the written report.

IV. Measurement Properties

Norm Group: Each of the three norm groups (developmentally disabled, non-disabled adults, and secondary students) consisted of more than 100 subjects from throughout the United States. Norming procedures appear sound.

Reliability: Test-retest reliability studies conducted at the norm sites indicated good reliability for the Motor Coordination (.88) and Form perception (.94) aptitude tests but moderately low reliability for the dexterity portions of the transit (.74).

Validity: VRI is to be commended for its efforts to establish the concurrent validity of the Vocational Transit by conducting correlation studies with a number of relevant instruments. Such efforts resulted in validity coefficients ranging from .70 to .84 in research involving the VIEWS, GATB, and APTICOM. Research efforts to date are encouraging.

V. Summary and Review

In Botterbusch's review of the Vocational Transit for the Vocational Research Institute, he explains that the user must accept the rationale that testing the "..aptitudes of Motor Coordination, Manual and Finger Dexterity, and Form perception for persons with mental retardation" will adequately evaluate for the 800 low level jobs covered by the system [p. 10]. Some would perhaps dispute this assumption. Nonetheless, Vocational Transit has made a logical assumption that the critical aptitudes tested along with added physical capacities, SVP, and educational development could indeed serve as an indicator of the ability of a developmentally disabled person to function in such targeted jobs. Their work in identifying such lower level unskilled jobs is commendable in itself. Those faced with screening supported employment clients (such as special education teachers who must prepare Transition Individual Education Plans [IEP], Mental Retardation agencies, and Rehabilitation facility personnel) would most likely find Vocational Transit a helpful tool when combined with other evaluation data. Attention to measurement properties is also commendable. The brief time required for testing is another plus.

Wide Range Employability Sample Test (WREST)

Precis

The WREST, refined, standardized and marketed in 1980, is designed to evaluate the culturally disadvantaged, mentally retarded, physically disabled, and chronically institutionalized. The system includes ten operations which are "found in most jobs in commerce, industry, and service." The system is available through Jastak Associates, Inc., P.O. Box 3410, Wilmington, DE 19804-0250, phone number (800)-221-WRAT or (302) 652-4490. The entire Employability Sample set sells for $1,600.

I. Description

The WREST contains ten work tasks (folding, stapling, packaging, measuring, tag stringing, gluing, collating, color and shade matching, pattern matching, and assembling) that are grouped according to the .687 and .887 Data-People-Things (worker trait functions) categories of the 1977 Dictionary of Occupational Titles. All work sample supplies, manuals, and forms are stored in one wooden cabinet and can be easily accessed.

The manual includes a brief history of the development of the system, theory and application of the samples, administration, summary profile form, instructions for each sample including photographs of proper set-up, scoring procedures, technical considerations, and case histories. Expendable supplies can be purchased from the developer in a resupply kit costing $120.

II. Administration

The evaluator should be familiar with work evaluation and individual testing. Training in the system is on a self-applied basis in conjunction with the manual. As with any system, the evaluator should review the standardized oral and demonstration procedures prior to administration.

The samples may be administered in any order. Each sample requires the evaluator to read the standardized instructions and to demonstrate the activity. The client then proceeds to complete an untimed practice period to gain familiarity and to develop mastery of the upcoming tasks. The evaluator is allowed to provide clients the opportunity to deviate from normal methods used to perform tasks to overcome any previous disabling condition. Each sample is then rated on the basis of total time to complete and the number of errors. According to the developer, each sample can be administered in 7 to 15 minutes or a maximum of 1-1/2 to 2 hours. The ratio of staff to client should be decided by the evaluator's ability to observe and rate effectively. An approximate client/evaluator ratio of 4:1 is suggested.

III. Scoring, Interpreting, and Reporting

Sample results are scored by hand and based on the time to complete the sample and the number of errors committed. The time to complete each of the 10 employability samples is converted to a quantity scaled score using any of three separate norm groups. These scores are then added together to obtain a total production quantity efficiency level which is reported as a standard score for each of the norm groups with a mean of 100 and standard deviation of 15. A production quality score with a mean of 100 and standard deviation of 15 can also be computed for each of the norm groups. The standard scores can then be interpreted using a classification system ranging from very inferior (below 70) to very superior (130 and above).

In addition to the computation of scaled scores for each sample, the evaluator rates each client on 10 behavioral dimensions (defined in the manual) which are then converted to standard or scaled scores. These ratings are to be made using the assumption that each trait is normally distributed throughout the general population.

IV. Measurement Properties

Norm Groups: Norms are available for both time and error for workshop, industrial, and general populations. All groups are from the state of Delaware. Local norms can be generated by the user or by arrangement with the developer.

Reliability: The manual reports test-retest reliability coefficients using industrial workers (N=428) of .90 or above. Such coefficients represent good consistency of performance.

Validity: Ratings of production workers (N=428) performance over a two-month period by supervisors were correlated with WREST Production Quantity and Quality Standard Scores resulting in coefficients of .86 and .92, respectively.

V. Summary and Review

The WREST was originally developed to assign newly referred trainees to suitable workshop contracts involving various types of assembly and packaging activities. These tasks were refined, standardized, and packaged in 1980. Much effort has been devoted to establishing a sound empirical base for the system which is evident in the technical data supplied in the manual.

The system would appear to have its greatest utility in settings which continue to have contracts requiring simple industrial tasks. The developer is encouraged to generate data related to the ability of the system to predict success in such programs. Finally, additional reliability and validity data on "sheltered workshop" populations such as that provided on industrial production workers would be most useful.

II

Job Search Software

Job Search Software: An Overview

Job search software has become an increasingly important tool used by vocational rehabilitation personnel in their quest to provide competent placements for their clientele. While the software does not take the place of local efforts to understand jobs and employers, it does provide a wealth of vocational data. The data are particularly helpful to those engaged in vocational evaluation, job placement, career counseling, vocational expert testimony, out-placement counseling, job accommodation, or to other professionals needing to know about the requirements of jobs in our economy. Thus, job search software has proved itself as useful as the interview process or testing in the arsenal of the vocational rehabilitation professional. At this point in the development of job search software, the "professional" is emphasized due to the complexity of job search data and the varying manner of presenting them. While there are some initial attempts at designing systems for use by clientele, the systems reviewed here are primarily designed for the professional who has adequate time to learn the system.

Job search software is a specialized type of database management program. In using computers, three types of generic programs have shown consistency across disciplines: word-processing, spreadsheet analysis, and database management programs. Basically, all a database management program does is store and retrieve data. It uses a preset layout of the type of data to be stored and describes the manner in which they are put in the program. Once data are stored in these programs, the programs are quite good at allowing data to be queried utilizing different search parameters. Thus, if the telephone book were kept in a database management program, the user could ask that all numbers starting with a certain prefix be identified. Similarly, one could ask for all numbers that contain the number 8 and/or originated from cities beginning with a certain letter of the alphabet. In this manner, the database can be electronically scanned and huge amounts of data can be reviewed before selecting the stored data which fit the search parameters selected by the user. In the same way, a job search software program stores information related to a group of jobs and allows a user to enter data about a particular worker. The characteristics entered about the worker can be compared with the job requirements to determine which jobs match the worker's characteristics. As they have evolved, however, job search programs have included additional databases allowing a mountain of data to be searched in order to select the specific information of interest.

Job search software not only allows the search for job matches for particular client characteristics but also provides information relative to the job selected. Therefore, it is not unusual to have a program which can indicate potential jobs and also provide information on salary, numbers, employers, and location of that job. For many vocational information users, the job search software programs replace most of their occupational information resources. More information can be developed in one place about particular jobs, and that information can be updated more quickly electronically than through print media. In short, it is better data and easier to use.

Within this consumer guide, there are two types of program methodology reviewed. The on-line method has the user, working from home, connect his/her computer via a telephone modem to a mainframe that contains the data. The user is then able to interact with the job search program over a long distance. In this system, the advantage is that the mainframe can be updated immediately as new information becomes available, assuring the users virtually instant access to the most recent data. In the other method, the software is sent to the purchaser and generally contains a manual and a number of disks that are loaded onto the hard drive of the user's computer. In this second method, developer updates are generally performed on a periodic basis and sent to the user via new disks which are then loaded over the old program.

In the following sections, an overview of the development of job search software will be given. This is followed by a description of the types of databases that are currently available. Features to look for on various programs will be discussed, as well as the types of searches or search logic used in these programs. The review concludes with hardware requirements and a short discussion about cost. In the description of each system, various features will be discussed.

Yet it is impossible to find one system which has all of the various features which will be listed. For the reader interested in purchasing one of these systems, it is recommended that the user examine features in terms of the user need for that feature. Once desired features are determined, the user should examine the reviews to determine which systems contain those features.

As in the work sample reviews, the user survey comments are included. Those comments were developed from the McClanahan survey, described in Section III of this book. That section provides graphs displaying user satisfaction with different components of the systems and these can be also reviewed to determine the user satisfaction across all systems. It is anticipated that this critical look at the systems with their various features as well as the user comments will provide more than enough information for potential purchasers to make informed and wise decisions.

Copy Protection

The notion of mailing an entire system to a user who is issued a license to use the system is cause for some concern to developers. Developers spend endless hours getting their system together and having it work without major glitches. To make a profit on their past work, assure adequate cash flow, and provide continual development and support of the system, developers must be assured that they will receive adequate compensation for each system installation. However, when they send a system to a user, that user can violate any agreement that was signed to acquire the system and make multiple copies of the system. There are specific laws protecting software developers from this piracy and there is a $10,000 fine for any one caught duplicating a system beyond what was agreed to in the license agreement. The entire software industry has implemented numerous copy-protection schemes to protect their material from unauthorized duplication. Unfortunately, most of these copy-protection schemes have not proved effective.

Now it appears that software developers have, for the most part, quit utilizing the various copy-protection schemes. This makes their products easier to use and more attractive to the buyer. Unfortunately, while the industry seems to be moving in one direction, software developed for job search usage has been moving toward copy-protection. In the most recent development in this technology, several developers have employed a sentinel hardware device which connects to the parallel port of a computer. This device will not allow the program to run unless it is in place. Thus, the user can install the program on as many computers as desired but can use it on only the one that has a sentinel plug in the parallel port. While this seems an ideal solution for developers, this approach seems to bring a new set of problems. In one system reviewed, it took several tries before the developer could get the sentinel to work properly, causing a delay of several weeks before the system could be used. In another system, the sentinel was working fine until a preestablished date was reached which stopped the software from working with the sentinel. In trying to reactivate it after the termination date, a significant amount of time was required with system programmers before the system was up and running again. Lastly, it is problematic for some computer users who use their parallel port for other devices to have to worry with yet another peripheral.

History of Job Search Software

The task of trying to match people and jobs has changed little in theory or ideation since the turn of the century when Frank Parsons suggested that worker characteristics should be matched with job requirements to determine the best fit. That notion of worker traits and job function matching has become the basis of job search software. Apparently, work characteristics information was first put on a mainframe computer by two young doctoral students, Billy Joe McCroskey and William Wattenbarger, at the University of Georgia. They were interested in developing a way to locate jobs and related occupational information which matched the requirements of disabled workers involved in Social Security Disability hearings. Thus, combining an interest in computers and a need to develop a job-matching base, use of a mainframe computer was employed in 1979. About that time, the VDARE (Vocational Diagnosis and Assessment of Residual Employability) concept was being formulated and utilized at the University of Georgia in their training for job-person matching. The computer offered an obvious way to sift through voluminous data. That process became the guiding methodology in the development of job search software systems. One of the first commercially available programs was produced in the early 1980s by Tim Field, a professor of Rehabilitation Counseling at the University of Georgia. Field selected 1,800 jobs which he believed were relevant to most rehabilitation clients. That program was first known as JOBS and later was sold to VALPAR to become the VALSearch Program. It was expanded to include all of the jobs available in The Dictionary of Occupational Titles (DOT). At about the same time, Billy McCroskey and William Wattenbarger developed the Datamaster 1.0 for commercial sale. It was the grandchild of their original work and was available for use on a personal computer. A contemporary of the developments at the University of Georgia was the Ability Information System (AIS), which was developed by George Watters in Spokane, Washington. It used a mainframe program containing all of the published DOT information available from the U.S. Department of Labor. The Watters' program required users to communicate via modem to the mainframe program and share time to perform a job search.

Sometime after 1983, the concept of a full-featured program containing all of the information from the U.S. Department of Labor, as generally found in the DOT, was ported from a mainframe program to the personal computer. This idea spawned two programs: OASYS from Vertek, Inc. and JOBS I from PESCO. Since that time, over ten additional systems have been developed which perform the same basic functions but in different ways. The early systems continued to be refined and developed to offer a greater number of features.

Types of Databases

Every system reviewed starts with the U.S. Department of Labor database of over 12,000 different job titles--most likely the largest composite database of jobs existing anywhere in the world. In order to generate such a database, the U.S. Department of Labor has employed job analysts to utilize their job analysis technique in breaking jobs down to essential elements and tasks, as well as providing their estimate of strength levels, physical demands, aptitudes, environmental demands, temperaments, and other relevant data utilized to characterize the jobs. Of the jobs selected to be included in their database, the Department of Labor utilized the process of analyzing the same job at several sites across the country and collapsing those three analyses into one final product. That job analysis has been published in the Department of Labor's DOT, now in the 1991 Revised 4th Edition. Unfortunately, much of the data collected and traditionally available on the various jobs have, for different reasons, been excluded from the 1991 edition of the DOT However, the complete data are considered public domain and are available, for a modest fee, to anyone who requests. The Department of Labor makes that data available on a once-a-year updated basis. The vendors reviewed here have purchased the DOT data for use in their system. An advantage of this database is its extensiveness. One disadvantage is the listing of numerous jobs not found frequently in a local labor market. A second disadvantage has been lag time in upgrading the data.

Every ten years, the U.S. Census Bureau performs an estimate of the numbers of people in the United States population. As part of that process, Bureau personnel collect occupational information on the population including jobs which they code into 503 categories. This includes more frequently updated wage data. An advantage to the census data is that the information can be provided for each state and county in the nation and can provide numbers of positions existing, as well as an average of wages paid for those positions. A disadvantage of the census information is that it collapses all jobs into the 503 categories. Thus, the categories are fairly crude, large conglomerates of different jobs ranging from physical capacities of sedentary work up through medium or heavy work. If this information is being used for rehabilitation purposes, this becomes quite an obstacle in defining the strength levels really necessary for those jobs.

A third database commonly used by these job search system manufacturers is information from the Office of Employment Statistics (OES), produced by the U.S. Department of Labor. This information is collected on job calls received from the Employment Service Offices in the United States. The attractiveness of these data is, again, in providing position openings and wages which are offered for those openings. This has a further advantage of containing jobs which frequently occur as open through the Employment Service versus jobs which might occur infrequently in the general economy as some of the jobs found in the DOT.

In addition to the major categories listed above, a number of job search software systems employ lesser known or more personally useful databases. For example, several systems offer the ability to build a local database on employers which the user has studied (e.g., WorkNet). Another database available in one system is comprised of jobs featured in The Occupational Outlook Handbook and the Social Security Administration's listing of 1,600 light and sedentary jobs. There has been an increasing interest in having these programs maintain a database on their clients, and some programs make available such client file database information. Programs are increasingly providing job listings, and some maintain employer-based databases which provide lists of employers who hire for specific positions that might be identified upon completion of a job search. Lastly, the more full-feature programs generally provide multiple databases which include several of the types discussed.

Features

As will be seen in the review of systems, purchase prices vary greatly. Generally, price differences reflect availability of features. While some developers include a number of features they believe will be attractive to the user at a set price, the idea of modular programs providing optional features at different costs seems to be growing in popularity. In any event, the more features one requires, the more the job search system can be expected to cost. Almost every system provides DOT code number and job title, as well as various job-coded data related to each title. Such DOT information, in and of itself, does not take a tremendous amount of storage capacity. However, users are often interested in having more than a title and coded information and desire the full job descriptions as found in the DOT as well as various other explanatory information about the codes. Thus, an additional feature which tremendously increases the amount of storage needed would be the job descriptions. Programs will often refer to crosswalk codes and, typically, this means that they provide additional coded information about each job which either can be searched in its own database or will allow the user to make use of that code for a specialized purpose.

Some of the programs will allow the user to search the database through certain filters which will look at information subsets of interest. For example, jobs might be searched by interest codes, such as the U.S. Labor Department's Guide for Occupational Exploration (Interest Codes section) to determine only those jobs meeting a person's worker profile in a certain interest area.

More frequently, programs are including wage data as well as projected numbers of jobs. Wages are often based on national census averages so actual local wages paid for a certain DOT code number might be hard to ascertain. In that case, the wages across a number of DOT jobs contained within the census code is given and often provided in an hourly or weekly format. Those are typically average wages, and some of the programs suggest reducing those by certain percentages to arrive at beginning wages. There are factors which can be applied to regionalize the wage data to bring it more in line with the user's local area. On one program, that factor could be entered or changed at will.

Another piece of information which is becoming more readily available are the numbers of jobs existing, based on the OES data, which also projects the number of jobs expected to exist for the next five or ten years. This is of interest in identifying a job a person can do, for expressing how many of those jobs exist in certain counties, and determining what the projection is for the future of that job.

One of the newest areas of expansion in these programs involves employer listings. Typically, employers are identified based on the Standard Industrial Classification (SIC) code used for various jobs. Employers are listed in the various job search programs and are thus matched to determine the employers who hire employees for specific jobs. Using this process does not guarantee that a particular job title will appear with an employer, but it provides a method of determining potential employers for various job types and industries. In these programs, employers are typically listed for the jobs along with a business address and, in some cases, phone numbers and personnel director names.

Some of the programs allow clients as well as jobs to be tracked so that the program becomes a client database which can also be searched. This should prove helpful to those conducting job development and looking for clients with certain characteristics to fit the requirements of jobs available. Thus, the client database in those programs can be searched to determine client matches for the jobs.

All of the programs allow the output to be printed. This printing, however, ranges from elegant to rudimentary. The better programs allow the information generated to be saved as an ASCII (American Standard Code for Information Interchange) file, which can be imported into word processors for editing. This is a handy feature. It incorporates bits of the job information or search for reports or offers the option of editing the output before printing. For programs that allow only printing, or even those that allow both, there are variations in the quality of the output printed. For example, some programs will allow only lists of matched jobs to be printed while others permit wage data, code numbers, and descriptions to be printed about each of the jobs. Above all, the best programs have a great deal of flexibility in printing options. Some programs have different formats, depending on the various uses. For instance, a program might have a consumer-oriented report as well as a vocational expert report with additional levels of detail and job descriptors.

There are additional features available on only a few systems. The first of these involves the reporting of physical capacity information. This does not make the system a physical capacity evaluation system. It does allow physical capacity data to be stored in a consistent way. On some of these programs, a printout is generated which can be forwarded to the medical community for completion of the physical capacities evaluation of the person. In contrast, other programs allow physical capacities of the job to be determined and keyed. In one program, a medical data conversion facility is built in. This is based on the Social Security Administration grids which can then be used to develop functional limitations from diagnostic categories.

Several of the programs allow the comparison of a job profile of the worker with specific job requirements in which the worker might be interested. In such programs, if the worker does not meet the qualifications of the job, these deficiencies are highlighted. Subsequently, these areas can be concentrated on in career planning and as training needs.

One program offers a module that provides accommodation under the regulations of the Americans with Disabilities Act. In that program, if there are limitations preventing a person from performing a job, then the program indicates vendors who might provide a piece of assistive equipment to help remediate that difficulty. Often, programs can provide some type of on-screen help which can be most beneficial. In at least one program, an actual tutorial is built into the on-screen help system. One program provides a measure of job complexity called Vocational Quotient which can also be applied to the client to determine the level of complexity of jobs that the client can handle. Lastly, several of the programs provide job analysis forms that can be used to gather the data necessary on the jobs to input to the program. Once all of these data are collected for the person and in place in the system for the jobs, typically the user has to determine the type of search that is desired.

Types of Searches

The underlying search design logic makes programs more or less complex. The more sophisticated the design, the more powerful the program. Generally, programs allow a search that examines all the vocational profile factors for the person and uses a ***less than*** or ***equal to*** logic in finding matching jobs. Using this approach, if a particular job has one characteristic that is higher than the person's profile, such as an aptitude factor at a higher level, then a job would not be selected as an appropriate match. Other programs use different logic, including one that makes use of an averaging scheme that allows the selection of jobs based on close vocational factors, either above or below the level listed for the person. In that program, the best fit matches are displayed.

Some of the more expensive programs offer a Transferability of Skills approach which meets the definition of that agreed upon by the Social Security Administration. In this approach, the Materials, Products, Subject Matter, Services (MPSMS) and Machines, Tools, Equipment, and Work Aids (MTEWA) codes are utilized for determining transferability of skills. The MTEWA codes refer to things that a worker uses on the job. The MPSMS or products code relates to the work-performed component of the job. Therefore, it is believed that if other jobs can be found that match a new profile utilizing the same tools and equipment and providing the functions on the same products, then the client should have transferable skills to this new job. Following this logic, the job(s) identified would require less training time. Typically, several transferability searches are offered making use of some or all of the codes as listed in the work history of the client; also offered is a search for the program that determines the level of specificity of the code.

The job search programs typically will allow a search of the entire database and then provide a listing of all of the jobs that match the worker profile. Some of the programs, however, will print only a certain number of matching jobs on some hierarchical category according to a preselected factor. A more flexible program will allow the display or printing of all of the selected jobs, rather than just a part. Therefore, the better programs would allow the user to make the determination of selected jobs they want to review. Similarly, some of these programs will allow a search of the entire database using a preinjury profile and a postinjury adjusted profile. These programs typically make a comparison between the numbers of job titles pre/postinjury or in some cases, the number of actual jobs pre/postinjury, and report a percentage of difference, referred to as "loss of access to the labor market." This concept has merit in courtroom testimony and in some states for the determination of vocational disability ratings. Programs that automatically compute this ratio can be helpful in such settings. Programs that provide all of the database search and select information can be used in the same manner but are not quite as convenient. Regardless of search methods contained within the programs, the better programs provide the flexibility to customize the program to match user needs, rather than being dependent on what the developer and programmer thought might be important. That probably is a true characteristic of better programs in all areas whereby flexibility is given to allow the usage of the program for the user's specialized purposes. It should be noted, however, that the more data contained in a program and the more flexible the program is in its access and use of that data, the more knowledgeable the person needs to be to use the program to its fullest potential. It has previously been noted that computers can be a labor-saving device by allowing the assimilation of great amounts of data to be examined rapidly; however, in the hands of the novice, grave mistakes can be made quickly with these programs.

Hardware

The use of job search software requires a personal computer. If the computer is accessing a mainframe program, any computer which can convert its characters to ASCII can utilize a modem to communicate with a mainframe or another computer. Therefore, IBM or IBM-compatible, computers or any of the Apple product line including the MacIntosh computers can be used in this process. Disks shipped by developers to computer users who utilize the program on their personal computer are typically formatted for IBM or IBM-compatible computers, and that must be taken into consideration in selecting a program. It would appear that if one were working on a MacIntosh machine, then the only current choice would be a mainframe-oriented, call-up program. Those programs that require a modem allow for an internal or external modem option and often can utilize various transfer speeds or baud rates. In general, the faster the rate of the modem, the quicker information can be transmitted back and forth across the telephone line, resulting in lower on-line cost. This is true only to the point that the developer has provided a great transfer speed on their end.

When thinking of computer memory, most people think of the Random Access Memory (RAM), and they think of the hard disk storage memory. The machines of today are composed of a maximum of 640 kilobytes (KB) of conventional memory (RAM) and can have many more megabytes of extended memory. As more and more programs are loaded onto the computer, each will take some of the RAM to store various program utilities, buffers, or device drivers. Often this is done at program installation without the user's awareness of the amount of conventional memory being utilized. Secondly, programs which leave some part of the program in residence, or residing in memory at all times, generally utilize some portion of the conventional memory. These database job search programs are very large programs which require as much as 550 KB of RAM in conventional memory in order to operate. Therefore, users must be cautious in installing the program to determine that they have enough conventional memory available for the program to operate. There are a number of techniques which can be used to free-up conventional memory, and this may be of concern to some purchasers. Of more concern to all purchasers are the numbers of megabytes (MB) of hard disk memory which are utilized in the storage of these job search programs. On the low end, some programs take as little as 5 MB of hard disk, while on the upper end the programs can go well over 30 MB of hard disk storage. For an older configuration such as an IBM 286 computer with 40 MB of hard disk space, some of these programs can very quickly take the entire machine capacity and, unfortunately, some users will buy the program without having any space on which to put it. Prices have come down so much for computers that it may be the time for those with machines several years old to consider upgrading to a newer machine with a much larger hard disk drive and a faster processor. These programs can run searches very quickly, but that is often dependent on the hard disk access time as well as the speed of the processor which is being used. Therefore, newer machines will typically run the programs much faster than older ones. However, gone are the days of 20-minute to hour-long searches. Now, people expect searches regardless of their complexity, to take no more than several minutes.

Cost

Typically, a set fee for the entire job search program is charged, or a unit price per module. This can quickly add up. It is not unusual to see program costs in the $4,000-$10,000 range as evidenced by those reviewed in this publication. There is an attraction to a mainframe program option in which the user pays a per-minute or per-hour charge plus a low entry fee. However, over time, this will prove as costly as paying the entire program cost up front. Secondly, with the purchase of the programs, it is wise to look at the up-date policy. Some programs have an excellent track record of regular updates, while other programs will give a schedule of updates. There may be an update and continuing support service fee which is charged to receive updated information. However, that is an investment well worth making since developers may frequently incorporate major changes to the databases. Because such changes may occur, an expensive program would become obsolete if the program were not updated.

While computer job search programs may appear, at first glance, an expensive type of specialized software, they are well worth their price for the user who has a need to access these types of data on a regular basis. From the previous discussion, it can be concluded that some programs are complex but offer multitudes of readily accessible data. It behooves purchasers to have some notion of how they plan on using the system they purchased and to decide what features they would desire before looking at the reviews. With that information in mind, the system which is right for any particular user should be relatively easy to determine. In fact, all of the systems reviewed here can be of excellent use to the right professional. It is hoped that the reviews as presented will provide the information to make an informed and intelligent selection from among the programs available.

CAPCO:
The Capability Corporation

Precis

The CAPCO System is the heir to the original Ability Information System (AIS) which was the first comprehensive job search program allowing a transferability of skills analysis through the MPSMS and MTEWA codes of the Dictionary of Occupational Titles (DOT) database. The CAPCO program is unique among those reviewed here in offering its services on a mainframe computer accessed by a terminal or personal computer. This allows it to be used with any personal computer and modem, which makes it the primary choice for those using the MacIntosh or Apple line. The program consists of four different functioning subprograms which all make use of the same database files but use them for different purposes and generally print out four different types of reports. The various sections of the program demonstrate a seamless integration of multiple databases which can be constantly updated by the developers on their mainframe so that users can have the most recent data at their disposal overnight. The cost structure allows for a low sign-on fee but a constant charge for limited access, which is expensive in the long run. Advantages of the program include the breadth of programs available, a low initial cost, excellence of the data available through the program, and ability to use various brands of computers with the system. Disadvantages include the need to be at a telephone to access the program via modem, inability to easily correct mistakes in some parts of the program, and higher long-term costs.

Introduction

CAPCO is as comprehensive a job search database program as is available today. It is unique among all of the other programs in that this program resides on a mainframe computer in Spokane, Washington, and users access that computer and the CAPCO program via a personal computer and modem with a call to a designated nearby town or large city. The user there accesses a special telephone line which is connected to CAPCO in Washington. The cost of the call from that nearest available city to Washington is included in the per-hour charge. The initial $250 front-end payment gains the user the Mirror III Communication software program that is provided by CAPCO and is preconfigured for the user's machine as well as for the CAPCO program so that it automatically dials the correct number and logs on to the mainframe, and then gives the right codes and passwords in the correct sequence to allow the user to get into the program. Once entering the system, the user is given choices including the choice to start one of the four main search programs, look at news on system announcements, find a report that has been worked on within the past seven days and retransmit it, or, lastly, exit from CAPCO. In relation to the report finder, CAPCO maintains a space for each user to keep client records for up to seven days on their mainframe. The four parts of the program include the placement problem solver which is the heart of the system containing the job search program. Secondly, the program has a pre/post option that allows a preinjury/postinjury comparison and gives a percentage of occupational loss. The third option is the career capability search that is tailored towards displaced or outplaced workers in the process of making a career change. Finally, the program has a job search service that helps job seekers locate information about jobs in which they are interested.

Development

CAPCO has been available since 1982 and claims to be the first on-line integrated comprehensive job search system utilizing (DOT) information which based its transferability of skills approach on the MPSMS and MTEWA concept. This approach was adopted by the Social Security Administration as their procedure of choice in determining transferable skills. The program was originally known as Ability Information Systems (AIS) and has also been known as the VIPS (Vocational Information Processing System). CAPCO has been the primary title since 1989. Regardless of title, the program has worked in essentially the same way since its inception with new features and enhancements added periodically.

Comprehensiveness and Use

CAPCO is an on-line, dial-up system whereby the operators use their personal computer with a modem as a terminal to access the system information on the CAPCO mainframe computer. The CAPCO computer is accessed and controlled from the user's PC through communication over a standard telephone line. CAPCO uses a computer telephone service called TYMNET for the long distance connection. The user dials a phone number to connect with the TYMNET service. CAPCO can be dialed from more than 450 cities in the United States. For users in those cities, the call at their office is local, while users outside those locations pay the long distance toll to the nearest city where TYMNET is accessed. The TYMNET long distance toll to the CAPCO computer is included in the per-hour charge for using the system.

When the system is purchased, the user receives a three-ring binder, several computer disks, and a communication software which must be installed on the user's computer. Installation is accomplished in several minutes, as is described in the Hardware section of this review, and is clearly explained in the software manual. The three-ring binder contains the placement problem-solver and the user manual consisting of nine chapters covering general information to specific instructions on parts of the system usage. The manual does an excellent job of covering what information is needed to use the system effectively. In addition, articles are sent that further explain the program and provide sample cases, quick start instructions, news and updates from CAPCO, and the supply of Mirror III Communication software which comes in its own notebook package. After the communication software is installed, the user enters the communication software and types "CAPCO," allowing access to the mainframe. Then the screen asks which service of the four is desired, and once selected that service function is initiated. Each of the four service areas will be explained in the following sections.

Placement Problem Solver (PPS)

The PPS examines the past work history of an individual (if any); considers functional limitations or unused potential; and suggests occupations based on transferability of skills, interests, or past industrial experience. Once jobs are identified PPS can further list businesses anywhere in the United States where employment opportunities might exist for those jobs. It can also provide average national and estimated wage information for the job selected. National and state-wide labor force statistics and group projections are available and are taken from the employment service projections. Known position vacancies and information about clients can be stored also. Clients can then be matched to the consumer's private bank of position vacancies, or they can be shared with community job banks. A number of crosswalk codes are provided so that the user has access to information about any selected job, such as the GOE code, Work Field code, MPSMS product code, Industry Designation code, Office of Employment Statistics (OES), SOC codes, census codes, wage information from the Bureau of Labor Statistics' Occupational Outlook Handbook, nationwide information about schools and training institutions, and business listings about jobs based on the 1987 Standard Industrial Classification (SIC) codes.

Once the user is in the PPS, seven choices are offered including building a work history, browsing for information about a specific job, developing a job bank to store actual jobs, developing the client job bank to store client profiles, choosing options, obtaining a printed report or saving the report to disk, and exiting the system. The program presents, therefore, a number of simple menu choices that explain the program steps and keep the user in the correct sequence. First, the user is asked to select jobs by typing in either the partial or full title. The program searches the job bank and comes up with a list of jobs that match that partial or full title, and the user is then prompted to select a number which is listed beside the job and also contains the title and industry designation. The user is asked if he/she wants to look at the coded information, and a simple Yes/No response is possible. Then the user is asked "Is this the job?" If the response is Yes, that job is entered into the client's work history. If a response of No is made, the program puts the user back into the list of jobs matching the partial or full title. Once the job is selected, the user is asked how many years the person has worked at the job, and the user also has the option of going back to the list of jobs that were previously viewed or starting over with a new partial or full title for a different job. Once all the jobs are entered, the user is asked if any code characteristics that might be below an average or median level were known to exist for that particular worker. If a person selects Yes, he or she is then taken to a composite worker profile screen that allows an adjustment on the profile. After all of the data are entered, the user is presented a screen in which choices can be made to adjust any part of the worker profile. A handy touch at this point in the system is that when variables are selected to make adjustments, the percent of jobs in the database which utilize those levels is displayed as well as the total number of jobs containing that level of ability. This is immensely helpful in assuring that the user is not being too restrictive and might eliminate a high percentage of jobs on a questionable rating problem.

Once all the adjustments are made, the computer prompt asks if the worker is able to supervise other employees. The entire search of the database occurs so quickly it seems almost instantaneous. The jobs, however, are not displayed but are instead stored in the client file that has been created. This is a frequent occurrence in the program in which everything that is done is stored in the client file without the user's having any chance to preview those findings at that time.

Following the job search, the user is asked if she or he would like to have labor market information about the jobs placed into the report from the search. That information includes labor force statistics data, wage data, and/or business listings if desired. In performing the search, the user has the choice of searching those occupational groups that are directly transferable; those that are closely transferable; those that were directly, closely, and generally transferable; and those groups that contain exactly or less than 50 worker trait characteristics. Again, the actual number of jobs in each of those categories is listed so that the users can determine if they want a small amount or a massive amount of job data.

At the conclusion of the job search, the user is asked if he or she wants to save the client information on a CAPCO computer according to the user's agreement and retrieve it later. If not saved, it is expected that the report would be transferred to the user's disk or directly to the user's printer. It would not make a great deal of sense to transfer directly to a printer, as that is such a slow means of printing and the information can be placed on disk much faster. Once on disk, the information is stored as an ASCII file which can be read into a word processor for editing or can be printed from the Mirror III Communication software directly after the conclusion of the session. If the information is to be imported into a word processing program such as WordPerfect, it takes some adjusting of margins to make the program line up correctly. A report that makes use of most of the data features can easily run over 60 pages and take between 20-40 minutes of connect time. One of the nice features, however, about the report is that it provides a table of contents on the first page that specifies the different major parts of the report and the pages on which they are contained. Reports contain significant amounts of explanatory data. The final report printout really is an excellent piece of work and, perhaps, the best reviewed on any of these systems. Another nice feature assists in looking for job statistics for a local area; both statistics and wages target a user's town, county, or zip code along with surrounding towns or counties if the user selects that option.

Pre/Postinjury Analysis (PREPOST)

The pre/post service works in a similar manner to the PPS service except that a search is run of the worker profile preinjury and a separate search is run with the adjustments made as a result of the injury. The program then prints out a three dimensional bar graph representing the difference in jobs in four categories: 1) directly transferable; 2) directly and closely transferable; 3) directly, closely, and generally transferable; and 4) unskilled only. For each category, the program provides a number of jobs pre- and postinjury, a percentage of change, and the bar graph showing the difference. A listing of the jobs can also be printed including selected information about each, such as the census code, strength, SVP, GED, and aptitudes. For the preinjury search, the program makes assumptions that the client is capable preinjury of performing medium-level work with all average aptitude scores and uses the constant term on the environmental and physical demand factors. Those can be modified, however. Following the pre/post search, the program allows the user to add information on census wage data, labor market data, labor force statistics, and business listings for selected DOT titles. The wage data uses the census median data that has been multiplied times a factor to regionalize it. While it does not give those in terms of entry-level wages, the program suggests that entry-level is 20-30% lower than these median wages. One of the problems with the system in several of the search modes and procedures relates to data input. If a mistake is made, such as entering the wrong number of years for a particular job, that mistake cannot be edited out and the user is required to back out of the whole process and start again, rather than make a simple change. Another problem is that the user is unable to limit the strength input to a single category, such as light only, as the program assumes the categories beneath it are within the capacity of the worker. On the PPS, the jobs printed out can be listed with user-selected and customized codes, but this feature is not available with a pre/post search. Another interesting feature of this program is that while searches are done extremely quickly, the fact that the program is limited to a 2400-baud modem makes the entire program actually run slower than a hard disk-based program contained on the user's PC.

Career Capability Search (CCS)

The Career Capability Search is of use for displaced/outplaced workers who are anticipating a career change. This part of the program was not reviewed because the reviewer was not authorized to utilize it due to a differential charge for using that service.

Job Search Service (JSS)

The Job Search Service is a resume-developed program and targeted job search. This part of the program allows the user to put job search and resume tips in the report, and it is written and designed to be used by the consumer. The three steps of using the program are to 1) look up the occupation being considered by job title or partial job title as in the other programs, 2) locate by state, city, or zip code where the person wants to work, and 3) develop the program and download it. Obviously this is a specialized focus of the entire system for users trying to find specific jobs, and it actually works exactly the same as other parts of the program, with the exception that the printout is tailored for this end. The program does a nice job, however, of selecting specific areas and locations in which the user is interested and identifying business listings that supposedly hire people for the listed jobs. It also provides the same wage data as was described previously. In all of the programs, the query about the businesses indicates the total number of businesses in the area considered, and the user has the choice of limiting the search to businesses of differing numbers of employees. The program gives information on percent of the total listing and the databank on those numbers of employees, which allows an informed decision.

Utility

This program has excellent utility for vocational consultants, including vocational rehabilitation personnel in both the private and public sectors, as well as vocational evaluators, vocational experts, job placement personnel, and counselors. The system is too complicated and costly per-minute to allow client usage. It is best used by the experienced vocational professionals who are interested in looking at job-related data for their clientele.

User Friendliness

Because these programs in CAPCO are menu-driven, the user can easily input or retrieve information; actually, the sequence is almost overly simplified. The screens are easy to read and follow, and there is a Help option. In addition to the Help function on the computer, CAPCO has a toll free 1-800 number that can be called in case of problems. This is available from 9:00-5:00 (Pacific Standard Time) Monday through Friday. With the exception of the problems listed earlier, whereby the user has to spend a good deal of time backing out of mistakes, the program is quite user-friendly and easy for the novice to follow.

Hardware

The program requires a personal computer that can convert its output to ASCII (any modern personal computer in America) and a modem to communicate with the CAPCO mainframe computer. This includes all IBM PC-compatible computers, Apple, MacIntosh, and other personal computers. The program requires a modem which is a necessary device to allow the computer to send signals to the CAPCO computer over the telephone line. Either an internal or an external modem can be used with a minimum transmission rate of 1200 baud; however, most current users use a 2400-baud modem. While modems are rated up to 14.4-million baud, the CAPCO has not upgraded to the faster modems, and the developer has suggested that this will be done when there is enough user demand. However, a different fee structure will be utilized as this information will be transmitted so much quicker. It is recommended that the client's computer have a printer attached so the information can be printed after working with the system. Last, a standard outgoing local telephone jack is needed to hook up the modem to the telephone. CAPCO recommends a separate telephone line with no call-waiting feature or extension phones. CAPCO can be reached at East 5805 Sharp, Suite 103, Spokane, Washington 99212, or they can be called at 1-800-541-5006.

Cost

CAPCO requires the new user to pay the $250 sign-on fee up front. As stated, this covers the cost of the Mirror III Communication software program. For the PPS program, there are three methods of payment including a $95-per-hour user fee, block hours of 60-hour blocks at an $80-per-hour rate, and a lease/option where a computer can be included in a lease for two years that also includes 60 hours per year of computer access time.

EZ-DOT

Precis

The EZ-DOT (Version 1.02) is a computer database of information contained in the Dictionary of Occupational Titles, Revised Fourth Edition (1991). Selected Characteristics of Occupations, Revised (1992), and the Revised Handbook for Analyzing Jobs (1991). The program offers an easily understood method to search for and print the information included in these Department of Labor publications. The program also prepares a job analysis checklist format suitable for ADA compliant job descriptions. The developer clearly indicates that it is designed to find occupational information quickly. It does not, nor was it intended, to conduct transferability of skills analyses. The data is maintained by the developer and is current as of January 4, 1993.

Development

According to its developers, the EZ-DOT is designed to "search, report, and print the complete set of information" available in recent Department of Labor publications. The system was developed by The Capability Corporation (CAPCO), E. 5805 Sharp, Suite 103, Spokane, WA 99212, (509) 535-5000.

Comprehensiveness and Use

The system's comprehensiveness can be evaluated in terms of its intended purpose. In this respect it does precisely what it purports to do: provide the user with quick and easy access to occupational information resources and the data contained therein.

After some introductory screens, the Main Look-Up screen is presented first. This screen allows the user to search for a particular job using one of several fields: Job Title (or partial title) or DOT code, Industrial Designation, Guide for Occupational Exploration (GOE) code number, Data-People-Things (DPT) code, or Occupational Group Arrangement (first three digits of the DOT code number). The job titles include the 12,741 base titles and over 31,000 alternate and military titles by which the base titles might be known. Cross references to the proper base title is done automatically by EZ-DOT. Each of these fields has an accompanying Help key <F1> which, when activated, displays a help message for the active field. For example, if one wished to search by Job Title, the <F1> key would provide information related to this method of job classification and a resource where one might find additional information. Activating the <F2> key from the Main Look-Up screen provides the user with a list of the choices one might consider in order to conduct a job search. Choices are available for all fields except the Job Title/Dot code field. Choices are listed in familiar phrases and can be selected using the arrow key or mouse.

Initiating a job search from the Job Title/DOT code field requires the user to enter the complete job title, a partial title, or the nine-digit DOT code number. Asked to search for the job of Claim Examiner, for example, the program identifies eight jobs and lists them on the screen. These jobs would include titles with the words "claim" and "examiner" anywhere in the title, in any order in the title, in any position in the title. This look-up method facilitates a very thorough search for titles which meet the key search word or phrase(s). The user highlights the job of interest by using the arrow keys or mouse and the program displays information as it is found in the DOT. Included is the DOT number and title, the industry designation, the full narrative job description, and the definition trailer which includes the exertional demands requirement (strength), General Educational Development (GED), Specific Vocational Preparation (SVP level), Guide for Occupational Exploration (GOE) code, and the date of last update.

Once the job of interest is identified and the narrative job description displayed, the user can view all the occupational characteristics related to the job at once using the <Quick View> Option. With this option a screen display of the job as coded according to the categories found in the Revised Handbook for Analyzing Jobs (RHAJ) is presented. Some familiarity with this coding scheme is necessary for this option to be of value. The developer has used sensible abbreviations to label the physical demands and environmental conditions factors, replacing the meaningless numbers used in the RHAJ.

The <Details> option presents a sequence of 8 screens which display the following information about the occupation:

Page 1 - The typical strength requirements and physical demands
Page 2 - An explanation of the environmental/working conditions in which the job is frequently performed
Page 3 - Narrative explanations of the Specific Vocational Preparation (SVP) and the General Educational Development (GED) Reasoning level required for the job
Page 4 - A narrative explanation of the General Educational Development (GED) Math level required for the job
Page 5 - A narrative explanation of the General Educational Development (GED) Language level required for the job
Page 6 - An explanation of the 11 Aptitudes (General, Verbal, Numerical, Spatial Perception, etc.) required to learn to perform the job at an average level
Page 7 - A narrative explanation of the Temperaments (Personal Adaptability) required of the worker to perform the job
Page 8 - Cross references assigned to the job by the Department of Labor and other resources

One can easily go from one screen to the next or view the previous screen of this eight screen record using standard function keys (explained at the bottom of each of the screens). The <Details> option is most useful for persons who do not possess an understanding of the various coding schemes and who would benefit from more extensive explanations.

The user has the option to print the information directly to a printer or to a disk file. Choosing the <Print> option brings up the print menu containing four print options. Print Options include:

Description: Job description as found in the DOT

Detailed Occupational Characteristics: The eight screens of detailed explanations of the expanded characteristics of the occupation (prints in three pages)

Quick View: The one-page display of all coded occupational characteristics

Job Analysis Form: Prints a nine to ten page checklist format useful in job analysis

This data can be sent to the printer immediately or it can be printed to a disk file for storage on either a floppy disk or the hard drive. The disk file can be used by any word processing package.

Utility

The EZ-DOT is a useful tool for any professional involved in the evaluation, counseling, and placement of persons with or without disabilities. The information from the various Department of Labor publications can be easily accessed. Operation of the system requires minimal computer expertise. Screen displays are logically organized and easily understood.

The job analysis format is an attractive feature useful in assisting rehabilitation professionals to conduct ADA compliant job analyses. Once a job is selected, a nine to ten page printout including overall purpose of the job, job/task statements, Work Field, Specific Vocational Preparation (SVP), General Educational Development (GED), Physical Demands, Environmental Conditions, Aptitudes, and Temperaments is generated. The format allows the user to modify this information to conform with information generated through an on-site analysis. The completed analysis can be used to counsel consumers regarding job requirements, for decisions regarding reasonable accommodation, or for employers to identify essential job functions.

One can also search for jobs by GOE code or industry designation. GOE areas of interest derived through testing or consumer self-report can be entered resulting in a listing of all jobs found in the specified category. Searching by industry designation allows the user to identify all jobs within any of the 140 industries into which all DOT titles are grouped.

Because of the simplicity of the system some consumers should be encouraged to conduct their own job search. Used in this way the program becomes an additional occupational resource useful in assisting the consumer to generate a wealth of information regarding occupations in which they might have an interest.

User Friendliness

The version of the EZ-DOT provided for this review consisted of nine 3.5 disks and one disk to upgrade the system. The program was installed on a 386 IBM compatible system in approximately 20 minutes. The developer notes installation times of approximately 50 minutes for XT and 30-40 minutes for AT machines. Information on the installation procedure is contained in the manual provided and is easily followed.

The system is remarkably easy to operate, but ease of operation can be enhanced by the level of knowledge the user has in relation to the various occupational resources on which the system is based. Proficiency, which can be reached rather quickly, places a wealth of occupational information at the user's fingertips avoiding the awkward and oftentimes cumbersome task of searching several Department of Labor publications.

Documentation

The manual provided with the system is logically organized and includes an introduction, installation/deinstallation procedures, program basics, search methods, printing and saving, and the job analysis format. Appendices include information on data references and troubleshooting. Descriptions of all phases of the program are supplemented with illustrations of screen displays.

Hardware

The EZ-DOT runs on an IBM PC or compatible microcomputer only and DOS 3.1 or later versions. It requires 11 megabytes of available hard disk space and is available on nine 3.5 or seventeen 5.25 disks. A color monitor, mouse and printer are optional. A network version is available suitable for multi-user, concurrent access on a Novell network. Other network configurations are possible.

Cost

The system cost, as of February 1993 is $295. Quantity discounts are available. Network pricing is based on the number of concurrent users. An annual maintenance option is available to get all of the most recent data updates and minor program enhancements. The annual maintenance fee is 15-20% of the system cost.

JOBS III:
Opportunity-Based Search

Precis

The JOBS III program is the most recent generation of job search programs developed and marketed by PESCO International, and it is one that has all of the features found on other premium job search programs and also some noteworthy additions. This 60-megabyte program (potentially more, depending on options included) has four characteristics which distinguish it from the other job-search programs: 1) a computer card scanning program which scores and norms tests and stores client data; 2) the capacity of the program to be used as an integrated component to the Compute-A-Match system which is a self-contained and comprehensive vocational evaluation system; 3) the addition of the Access-Ability System which identifies potential accommodation and adaptive devices for many of the jobs listed in The Dictionary of Occupational Titles (DOT); and 4) a program specifically designed for use with veterans. In addition to comprehensiveness, strengths include versatility, continual updating and development, and facility with most vocational assessment instruments. Limiting considerations include cost and, due to the multifaceted nature of the program, the fact that program-specific training is recommended.

Development

The original program, JOBS, was introduced to the market place in 1983 by PESCO International, the developers and marketers of the SAGE (System for Assessment and Group Evaluation), a system which is also reviewed in this publication. The second generation of the JOBS Program, JOBS II, was developed in 1989. It included the data from the 4th edition of the DOT and contained the expanded format of the physical demands and environmental sections to the current status of 20 physical demands and 14 environmental factors (previously there were 6 and 11, respectively). In addition, PESCO packaged the SAGE Program with the JOBS Program for a comprehensive system known as the COMPUTE-A-MATCH. The current version of the JOBS III Program has incorporated the most recent DOT-related occupational information. This version of the JOBS Program was developed for PESCO by Neal Grossen, Ph.D., and the sources for its data are the U.S. Employment Service, the U.S. Department of Labor, and the North Carolina Occupational Analysis Field Center. Screens and data entry windows were created using Vermont VIEWS (Vermont Creative Software, 1988). PESCO International is located at 21 Paulding Street, Pleasantville, New York 10570; phone: (800) 431-2016. System updates are provided free of charge on a regular basis and are easily installed over the existing program by way of system disks.

Comprehensiveness and Use

The major functions of JOBS III include an automatic scoring system, an employer bank (which can either be loaded on by PESCO at an extra cost or input by the user), a report-writer, a job search and matching program, a comprehensive and up-to-date edition of the DOT with all of the accompanying codings, and the AbleData information bank which links adaptive devices for many of the jobs in the DOT.

When the JOBS III Program is activated, the initial screen provides the various citations of data sources and copyrights and also a boxed-in message to the user advising that the computer should not be shut off in the middle of the program. It requires the user to respond "Y" (Yes) to continue into the program. The second screen prompts the user to input a password determined by the user; this serves as a security device which is included to prevent access into the program by anyone other than an authorized user. The JOBS III main menu then comes up and displays the following options:

A. AUTO SCORE PROGRAM
B. COMPUTE-A-MATCH OPPORTUNITY BANK
C. CLIENT REPORTS
D. ALL FILE MAINTENANCE SELECTION ROUTINES
E. JOBS SEARCH PROGRAMS
F. DESCRIPTIONS AND PROFILES OF DOT
G. COMPILE PROFILE FROM JOB HISTORY
H. TABE (Test of Adult Basic Education) SUB SYSTEM
I. ACCESS-ABILITY-SYSTEM
K. SERVICES PROGRAM
L. PRINT FILE ON PRINTER
M. DELETE CURRENT PRINT FILE
N. PRINT SAVED PRINT FILE
O. SCORE-A-TEST SUBSYSTEM
P. TUTORIAL SUBSYSTEM
Q. EXIT JOBS III SYSTEM

JOBS III is fully menu-driven. At almost any point in the program, the user can access the Help function by pressing <F1> and can also view, edit, or print the Print File by pressing <F6>. <F10> saves the data to the disk, and <ESCAPE> or <Q> usually will return the user to the previous screen, or, in the case of the first main menu screen, to the DOS System. All of the screens, with the exception of the Auto-Scoring program, allow the user to search the client data bank for an existing client or to create a new client file. The Auto Score Program, which uses a card reader/scanning device, allows for a client file to be created using a client bank data card which is read by the scanner. The Report Writer function is easily accessed by pressing <F6>. The program comes with its own editing program which is simple to understand, though not comprehensive. This editor can be substituted with other word-processing packages with which the user has greater familiarity (i.e., WordPerfect 5.1, etc.). A helpful addition to the program would be a window or split screen allowing the user to view both the document and the commands simultaneously. Following are descriptions of each of the functions of the JOBS III main menu.

Auto Score Program is the option chosen for scoring, norming, and storing test and other client data. The Auto Score Program provides four alternatives for selection of norm groups: vocational school, employee workers, low-functioning norms, and composite junior high/high school. The option for adding Standard Error of Measurement (SEM) to all of the scores is included. Although the primary function of the Auto Score Program is useful with the SAGE program, an interesting capacity is that it can be used with tests programmed by the user.

The **Compute-A-Match/Opportunity Bank** takes the user into seven different search methodologies, all of which are intended to match client profiles to local opportunities including jobs and/or training programs. The Opportunity Bank can match any or all clients in the client bank to a single opportunity, which could be useful for a job development specialist who has identified a job opening but needs information about any job-ready clients for best match. The Opportunity Bank contains wage data by geographical area indexed by SOC Codes; additional wage data by DOT or OES codes is available from the developers at an additional cost.

The **Client Reports** menu provides two functions including Generate Client Reports and Match Clients by Skills. The Generate Client Reports allows the user to generate a fully customized report or select one of the built-in reports. The built-in options for reports include a) job history, b) vocational interests, c) Cite Profile, d) TABE results, e) detailed or survey reports, f) generic descriptions of aptitudes, g) descriptions of the SAGE aptitude test, h) descriptions of Guide for Occupational Exploration groups, and i) listing of potential jobs which are consistent with the data contained in the client bank. There are also the options for selecting an individualized Employment Development Plan print-out or a report which details client-tracking information.

Once the selections have been made, the user can input either a client name, ID, type in ALL (which would print reports for all of the clients in the client bank), or PICK. The PICK option allows the user to select specific clients previously stored in the client banks. The "Match Clients by Skills" of the Client Reports Menu is a user defined file which is loaded by types of skills and levels of skill-specific proficiency. The user defines both the skill and the criteria for the proficiency rating, which is preprogrammed on a four-point hierarchy. The utility of this option is manifold. For example, if a job development specialist located a computer operator position which required that an applicant be familiar with various software applications (i.e., Wordperfect, Lotus III, etc.), this option could be used to search the client bank for individuals with those skills.

All File Maintenance Selection Routines is a maintenance file which allows the user to add, revise/edit, browse, delete, mass delete, or clone the various data files in the JOBS III Program. The data files include the Client Bank, the TABE Data File, the Cite Data File, the Vocational Interest Inventory, the Score-A-Test data file, the Employer Bank, Plan and Report Writer, the Opportunity Bank, the DOT file, the OAP file, and the Other Maintenance/Reports file. Two intriguing aspects found in the **All File** option are the Infostat program and an employer file. Infostat is a PESCO developed statistical program which allows the user to obtain statistics (mean, median, mode, distribution, frequency, etc.) on any number of variables pertaining to Client Bank data file. The employer file, option "L," is a dial up feature which allows the user to obtain employer information anywhere in the United States (there is an on-line fee).

The fifth option of the main JOBS menu, the **Jobs Search Programs** is the option with which evaluators will find greatest utility and is the one which accesses the largest databases. The **Jobs Search Programs** allows the user to either input a new client or search the DOT using an existing client/student profile, but conveniently allows the user to modify the client data prior to conducting the search. It also allows the user to pull up a single description of a DOT job by either the code or title. Once a user has made the decision as to whether or not to search using an existing client from the client data bank (which is accessed by either the last name, the beginning letter of the last name, the ID, or the "ALL" or "PICK" options), the user is then allowed either to conduct a worker trait factor search or to search using other codes. These options include the GOE interest code search, the MPSMS search, Work Field Code Search, Occupational Group Code Search (first three digits of the DOT code), the Data, People, Things (middle three digits of the DOT code), SOC code search, Census code search, CIPS code search, or OES code search. Descriptors of each of these codes in the Help File are not included but would be of some utility. Once the modifications have been made to the client profile, the program asks for the maximum number of available mismatches across the profile. The program then requests from the user at intervals of 100 selections whether or not the user wants to continue searching. Once the search is complete, the user can print out descriptions for any, none, or all of the job titles listed. The program, after selecting the jobs, allows the user to crosswalk codes, using job outlook OES codes for the job outlook matrix (which presents growth rate statistics for the job titles), crosswalk using the job outlook SIC codes, return and search again, or search using an alternative method.

Descriptions and Profiles of DOT allows the user to pull up descriptions of jobs and also links to adaptive devices which might be useful in overcoming functional limitations. The user can call up jobs by entering the DOT number, in whole or in part, or enter any part of the word. The use of an asterisk (*) at the beginning or end of a word directs the search to select all words in the DOT containing the root word, or letters. For example, *teacher would search and find high school teacher, shop teacher, gym teacher, etc.

The **Compile Profile from Job History** option allows the user to input as many job titles as there are in the client's work history, and compiles the highest levels achieved in each of the worker trait factors. When inputting the work history, the user is prompted to enter the employment dates. The program automatically calculates the length of time employed and determines whether the Specific Vocational Preparation (SVP) requirement has been satisfied. If the SVP is met or exceeded by the time period worked, the user is prompted to enter the next job. If the time period is inadequate, the user is so advised and then allowed to either override the SVP requirement or not include the job for the transferability of skills analysis. The work history, once stored to the Client Bank, serves as a precursor to resume' development. After all the work history has been entered, the program compiles the worker trait profile, then asks the user to modify the profile in any way. Once the work history has been compiled and then modified, the program permits the user to select one of four different search options. On all the search options, the user can search using the compiled work history worker trait profile, or the profile obtained from testing. Three of the options are ones that are designed to have some degree of relationship to those jobs in the individual's prior work history, with the fourth option being the worker trait factor search. The three searches permit various levels of skill transfer utilizing common 3-digit MPSMS and full 3-digit work field code correlations and also incorporate the capacities of the individual as detailed in the worker trait factors profile. The second option, which is listed as "may require some training," is a moderate skills transfer using the first two digits of the MPSMS and work field codes while the third search methodology is simply based on the first two digits of the MPSMS code. The final search methodology on the Compile Profile from Job History option is one that includes eight other searches using the Data, People, Things numbers. The High Skills Transfer does, in fact, generally lead to a listing of jobs that have immediate recognition as ones that would be related to the jobs in the work history, while the other two search methodologies usually bear some resemblance to employment found in the work history. The Search Using the Other Codes option actually searches by the codes of SOC, SIC, GOE, MPSMS, etc. The program then links to an employer bank via crosswalking, using job outlook OES codes, and lists employers by zip code and size (depending on the option selected), complete with addresses and phone numbers. Following the employer bank, a job outlook matrix can be requested detailing the growth rate of those jobs selected. The option for searching for accommodation devices is available for many of the jobs.

The **TABE Subsystem** is a menu item offered for those using the TABE (Test of Adult Basic Education) and those scoring it utilizing the card reader, which is an option which can be purchased along with the JOBS III Program. This menu item offers the options of selecting norm groups for the TABE, the selection of standard error of measurement, and the various different types of reports which can be generated.

The **Access-Ability-System**, which uses AbleData as the data bank, is a distinguishing feature item on the JOBS III Program. The primary function of this option is to provide information regarding accommodation devices for jobs listed in the DOT. Descriptions of the devices are included with a manufacturer list which details costs and addresses. The developers promote this feature as complying with the intent of the job accommodation requirements of the Americans with Disabilities Act. The data bank for the adaptive/accommodation devices is substantial (approximately 15mb), covers over 10,000 adaptive devices, and is linked to approximately 60% of the DOT jobs. In addition to the linking of this data bank to job titles, the adaptive devices can be obtained in variable ways including the use of keywords such as "lift," "finger," etc. The Access-Ability-System can be an excellent resource for career planning by evaluators and also professionals in the employment sector.

The **Services Program** option is designed to translate military service job titles or codes into the civilian nomenclature of the DOT to facilitate evaluation and placement of veterans. In addition to crosswalking from military to civilian codes, this option offers the opportunity to obtain employer information anywhere in the United States by accessing a mainframe and downloading the desired data.

The next three options on the main JOBS III menu, the **Print File on Printer**, **Delete Current Print File**, and **Save to Print File**, serve to function as one might intuitively expect. The **Save to Print File** allows the user to save and to later retrieve a print file which the user might have saved at any time in the past and print it on the printer at any time.

The **Score-A-Test Subsystem** allows the user to use the card reader to score and analyze customized tests.

The **Tutorial Subsystem** contain U.S. Department of Labor definitions of the DOT and much of the related codings, a glossary of terms, and DOT master titles and definitions. This tutorial, which is a unique feature of the JOBS III Program, is interesting and helpful.

Utility

It is obvious that the developers intended this program for use across a wide variety of disciplines. The program has obvious utility to vocational rehabilitation providers (evaluators, counselors, job development specialists, etc.), JTPA providers, ADA specialists, career counselors, and virtually any professional engaged in the business of providing vocational consultation. It serves as a tremendous database for vocational experts, though the process of providing pre- and postaccess to jobs is not one that is clearly defined in the program: This program intends to be a comprehensive one which serves for not only job searches and identification of career goals but also job or employer file record-keeping, client record-keeping, and even scoring by way of a card reader for all types of paper-and-pencil tests and inventories.

User Friendliness

PESCO International recommends that the user dedicate a computer exclusively for use with the JOBS III Program. This massive program has, by virtue of its versatility, various complexities in the programming process which makes full dedication desirable. The developers of the JOBS III Program encourage customers to consider their "turnkey" computerized system. PESCO will ship in its entirety the JOBS III Program which includes all of the hardware (computer, monitor, card reader, printer) and provides training. If the users prefer to have the program loaded onto their own computer, one of three installation options are available, including 1) PESCO will send out the program and data disks and the purchaser can use the Install command, 2) the customer can ship the computer to PESCO for installation, or 3) PESCO will ship or install a loaded hard card. The JOBS III developers have gone to great lengths to improve the Help screens of the earlier JOBS versions and have been successful. This reviewer found the Help screens to be quite helpful, though it should be noted that an individual not as familiar with vocational software may still encounter some difficulty. All of the screens, however, are very helpful in prompting the user as to what commands are acceptable (unacceptable entries are responded to by a beep), and facility with most components of the program can be mastered in a short period of time. In order to fully appreciate the size and multifaceted nature of the JOBS III program, it is recommended that training be purchased with the program.

It would be helpful if the Help screen contained much of the information in the tutorial option of the main menu, particularly if the tutorial itself were expanded. This is a difficult recommendation to make as this tutorial is a unique feature, but it brings to mind the complexities of vocational evaluation and how handy a pop-up screen would be that defined many of the codes utilized in the program.

Documentation

The JOBS III Manual is a useful and comprehensive 452 page reference. Contained in a three-ring binder (for easy insertion and removal of program updates), the manual consists of 15 detailed sections plus technical information and a glossary. The order of the sections follow the main JOBS III menu for quick reference. Practitioners will find the manual "user friendly," both in terms of the layout and the up-front responsiveness to user questions.

Hardware

The JOBS III Program requires at least 4 megabytes of RAM and 60 megabytes of hard disk space (though the developers recommend 120 megabytes for expansion and updates) on an IBM-PC or compatible microcomputer using PC-DOS or MS-DOS operating systems or a network. The program can be installed onto a mainframe. An activating hardware device, without which the program will not run, comes with the program. This device is plugged into the printer parallel port of the computer and is a security device to preclude unlawful use or duplication of the program.

Cost

The complete program cost is $8,500, which includes the loaded hard card, plus $350 per year on-line support for a 1-800 number. The hardware (computer, monitor, printer, and card reader) can be purchased from PESCO or elsewhere. Updates are provided at no cost. Volume discounts and network setups on Novelle and Unix are also available. Current JOBS II and JOBS I owners can upgrade to JOBS III for $2,500 and $4,500 respectively. Also available are scaled-down versions. The Veterans Program sells for $4,500, and the modified JOBS program which features the Transferability of Skills Searches and Job and Opportunity Bank sells for $3,500. Training, which is recommended, is an additional charge.

LIFECORP Products Network

Precis

The LIFECORP Products Network is a group of 12 computerized job search and related modules which can be integrated into one large system or purchased by the unit. The system provides a multitude of methods to search the U.S. Department of Labor's database as found in the Dictionary of Occupational Titles (DOT) and also provides modules to convert test scores to worker trait profile information or Methods-Time-Measurement standards; question individuals as to their worker trait profile abilities; develop a physical capacities profile; perform a preinjury/post-injury search with a calculated loss of access to the labor market; develop a local job bank; word-process to edit job descriptions; develop a local labor market database; develop a placement potential profile; and write reports. The two job match databases incorporate the DOT or a locally developed user job database. In searching the data, fifteen different search logic selections are available that allow the user to exert maximum control over the search methodology. Advantages of the system include the breadth of possibilities with this system, user-control of the system, attractiveness of the opening screens, system support available on-line, and uniqueness of several of the modules. Disadvantages include higher cost compared to some other job-search software and the time and expertise needed to use the software to greatest advantage. The system cost is determined by the modules selected.

Development

LIFECORP was developed by Drs. Donald R. Ross and Charles J. Rastatter, both of whom were formerly affiliated with the VALPAR Corporation where they were original developers of the VALPAR Work Samples, a computer assessment program, and job-matching programs. LIFECORP was copyrighted in 1989 and first introduced on the market in March of 1991. At the time of the review, the developers had not completed changing the system to the 4th edition revised DOT data but are in the process of making that conversion. With the number of modules they offer, it requires a major effort to reprogram the twelve modules to make this significant change in the upgrade, which is certainly a problem for all larger, integrated systems.

The purpose of the program is to provide the user with information about an evaluee in relation to the world of work. The program was designed for use by vocational evaluators, occupational/physical therapy programs, and other rehabilitation professionals who need information on jobs, test score conversion, physical capacities, and writing reports of the results. LIFECORP is available through Life Systems Enhancement System, Inc., located in Tucson, Arizona 85732 (P.O. Box 13853). Telephone: 1-800-752-7004. As well as dealing directly with the company, users can obtain the program through a regional sales force. The LIFECORP program is written in a FOXPRO, a database program. LIFECORP warranties that their program contains no defects or bugs and, if one is detected, the company will replace the defective disk or correct the errors in the program free of charge. If a user wishes to purchase part of the system, that is possible, and new modules can be added later for the price of the module. In addition to the modules (which will be discussed in the next section), LIFECORP has recently added a module called *Careers 2001*, a career exploration product. This product is not reviewed here but the manufacturer suggests that it can be used to identify and explore the fastest-growing careers and jobs in the 1990s through the year 2000 by providing national, state, and local wage and work force information, and it allows a focused search of the entire database which would locate careers that match a specific career profile. This module sounds similar to data available in other programs, but is unique in the way it allows the search to be focused toward the specific career profile areas.

Comprehensiveness and Use

LIFECORP has produced a large modularized program which should appeal to the taste of the information junkies who want to view their vocational data from many angles. At the heart is a DOT job search program with a large number of user-control search methodologies. For additional costs-per-module, the program can provide a number of enhancement modules which provide specialized functions that might be of use to different rehabilitation professionals. These modules, therefore, may function independently or can be put together as one larger integrated system. Of importance to the buyer is the fact that the programs are completely intertwined so that work in one module can be utilized by the other modules. The following list will detail the purpose of each of the 12 modules:

<A> ULTRAMATCH: This is the basic product of the LIFECORP Network. It contains all of the coded job data from the DOT jobs but it does not have the DOT descriptions. The Ultramatch module does allow editing of the job list to include only those appropriate for the client; viewing of the jobs by occupational categories, division, and groups; viewing jobs by title or DOT number; and being able to obtain a worker trait profile for any job. In addition, it has crosswalk codes to the census numbers and SIC numbers.

<B> ULTRAMATCHPLUS: This is the exact same product as the Ultramatch with the addition of the DOT narrative descriptions. In purchasing a program, the user would select either the Ultramatch or UltramatchPlus and would not have a need to buy both modules.

<C> TRANSFERABLE SKILLS ANALYSIS: The Transferable Skills Analysis module allows the building of a previous work history which automatically develops a composite profile of the workers' highest levels of abilities as determined from their previous jobs. The profile developed from the previous jobs can be edited and changed to allow a search based on their composite abilities with changes for such things as physical limitations.

<D> TEST CONVERSION ANALYSIS: This module allows scores on 63 tests to be converted into worker trait profile information that can be used in the search process. In addition, this module develops and gives the Methods-Time-Measurement (MTM) standards for each dexterity test and work sample on the data entry menu. A Test Conversion Analysis will work with the Purdue Pegboard, Bennett Hand-Tool Dexterity Test, Crawford Small Parts Dexterity Test, Minnesota Rate of Manipulation Test, VALPAR Work Samples, and others. As new tests are added to this utility, the user will receive free updates to the program on a quarterly basis. If the user has particularly favorite tests that are not part of this module, LIFECORP has pledged to analyze the tests and include them in the user's Test Conversion Analysis Module at no extra cost. The developer claims that the content and design of this module meet all Equal Employment Opportunity Commission criteria for qualification standards and employee selection with the Americans with Disabilities Act.

<E> REPORT WRITER: The Report Writer contains several formatted report templates to allow a comprehensive output report from LIFECORP or a brief report format. Further, the Report Writer has the facility to allow the users to change the formats or develop their own format that meets their needs with this data. In any of the formats chosen, comments and recommendations can be input by the user.

<F> COMPETITIVE EMPLOYMENT ANALYSIS: The Competitive Employment Analysis module prompts the user to respond to a self-survey form that develops a worker trait profile from the user's responses. This self-survey can be administered in a written form,

which allows it to be done away from the computer, or with a group and input at a later time. An optical scanner data entry system is available for this module as an extra-cost option.

<G> RESIDUAL FUNCTIONAL CAPACITY ANALYSIS: This module essentially develops a worker trait profile survey form that can be used by physicians. It has the features to print a letter to the physician requesting information about the clients' physical abilities, which can later be compared with the worker survey of their abilities from the previous module. In this module, a diagnostic category is chosen based on the physician's records and a physical and/or mental residual functional capacity questionnaire is completed, based on the physician's statements. This module also contains the Social Security regulation grids for determining disability. It also has a patient assessment of physical or mental limitations which can then be compared to the physician's assessment. The module also contains several form letters for following up with physicians to determine if they have changed their assessment over time.

<H> PLACEMENT POTENTIAL PROFILE: This module takes the information generated and saved in either Ultramatch or UltramatchPlus, the Competitive Employment profile, or the Residual Functional Capacity profile from the other modules and allows that profile to be edited or reset in the job bank search based on that profile. Basically, this program then integrates the information from the various other programs in order to develop a composite search profile which would be used to search the database. NOTE: This product is received at no cost if at least two other modules in the network are purchased that develop a worker trait profile.

<I> EMPLOYABILITY ACCESS ANALYSIS: This module provides a preinjury/post-injury search of the database and automatically calculates the percent of employability gain or loss based on the differences in the two profiles. An option is available to include wage data based on the national census data. Another option exists to use the national statistics or state statistics in wage search as well as the option to use male, female, or combined wages.

<J> LOCAL JOB BANK: This module allows the development of local job information based on downloading jobs from the DOT description and worker trait data. In this way, a smaller local file can be developed that contains only those jobs known to be in the local labor market.

<K> JOB DESCRIPTION WRITER: This module is basically a word-processing program that allows the editing of DOT descriptions or the creating of new job descriptions in worker trait profiles in user-defined formats. Lastly, the program allows the user to download the DOT job descriptions and worker trait profiles and edit those to generate requirements of a local job description profile.

<L> LOCAL LABOR MARKET: This module allows the user to build local wage, hours worked, and accessibility information about local jobs and allows a search of that data. A standard part of this product is the provision of national wage data and work force data which can be used in litigation.

In using the program, the user first selects a person's file with which to work. If there is no file that previously exists, one can be built. In building a file, a person's name, Social Security number, marital status, address, phone number, occupation, date of injury, ability to drive, referral source, disease history, and billing source are entered into a client database. The clients are kept in an alphabetical list with their Social Security number as their identification and the date entered. After the client is selected or client data are entered, the user can proceed to any of the previously described modules and begin work. Normally one might go to the Ultramatch or UltramatchPlus and build a work history, based on the previous jobs. If UltramatchPlus is selected, the worker traits are defined based on the user's input of the client's ability to work, and the job bank can be searched based on that input profile. On the other hand, if the user wants to develop a work history and search the database from the work history, he/she would go to the Transferable Skills Analysis module and begin entering the person's past work. Entering the work history starts with a screen which contains 14 DOT job titles, beginning with Able-bodied Seaman as the first title. As the job name is keyed in, the 14 jobs on the screen change to those with that series of letters in the first part of the name. Therefore, that screen is always shifting until the user determines that the correct job is highlighted. When looking for the jobs in this manner, the codes are not displayed nor is the industry displayed. This is problematic when several jobs of the same title are displayed in trying to determine which is the correct job and the user is required to open the job description or coded information for each of the same-name jobs until the right one is located. When the correct job is found, the <F1> key captures the correct job which has been placed in the client's work history file. Once all jobs are selected, the <F10> is entered, which stops the process and asks the user a series of questions about the dates worked and past salaries. The user is given the options to include or exclude any jobs in the previous work history in the development of the client profile. The history can later be modified or examined in this process.

The next choice for the user is to search a job bank based on the profile developed; however, the user is allowed to edit that profile to eliminate parameters that are not desired in the search. For example, entering information about the client's temperaments or searching only the same data-people-things may not be desired and can be eliminated. The highest level of crosswalk codes can be put in to limit the search to particular industries or census codes, CIP codes, work fields, or MPSMS codes. In this way the search can be filtered by any or several of those parameters. Once the user is satisfied with the developed profile, the next logical step would be to search the database. At this point, the LIFECORP product shows one of its more unique features in giving the user 15 choices on types of search logics which can be used. Those would include items such as using only parts of MPSMS codes as a search parameter (to get a broader grouping of related jobs) to using very exacting codes (to look at only jobs with those specific work fields or industry codes). A standard search can be selected which looks at all jobs in the DOT database which have the exact same code number or lower than what was developed in the composite profile. In this way, the user can be very particular in the way the data are searched. This obviously takes a sophisticated user who understands what these codes mean and how to use them in order to effectively employ this part of the program.

All of the screens use one of two different menu selection systems that work consistently across the entire group of modules. Letter codes are available for each screen, or selected <F> key-defined menus are given at the bottom of some screens with, again, a consistent way to work through the screens or back out. In most cases, <ESCAPE> key backs the person out of the screen to a previous choice or screen. In that way, the program is easy to use and follow with the menu choices.

Utility

LIFECORP would best be utilized by the professionally-trained vocational rehabilitation expert who has a detailed knowledge and understanding of what is to be looked for in a computerized job search program. This program allows one to investigate many tangents and requires the user to have a sophisticated understanding of what those different directions can do in order to utilize them effectively. Therefore, it seems of most value to rehabilitation and job placement professionals, as well as vocational consultants and experts including vocational evaluators, counselors, placement specialists, or disability determination experts. As in other large programs, this program contains a wealth of labor market information from national data and some local data and also has the ability to customize the program to develop the entire database on the local labor market. In addition to the typical search features, it allows a determination of occupational loss based on the pre- and postinjury number of job titles discovered, and it computes a percentage of loss as well as the wage loss. It goes beyond most of the programs in providing a word-processing section in which job descriptions can be written and edited. Finally it provides a residual functional capacity analysis program that allows the development of physical capacity evaluation forms to be filled in and a test conversion analysis to change test scores to information that can be utilized by this program.

User Friendliness

LIFECORP is shipped to the user with a large three-ring spiral notebook and a number of disks that are loaded onto the user's hard disk drive. Depending upon the modules selected, the program can take from as little as 10 megabytes of hard disk space to as much as 30 megabytes of hard disk to contain all the files. Installation instructions are quite clear and involve typing "install" with the installation disk in the A drive and following the on-screen instructions for changing disks at the appropriate time. The program is a menu-driven program making it relatively easy to navigate in and out of different modules. The opening screen is quite attractive, using a multicolored, three-dimensional windowed view of the different module choices. Selections are initially made by selecting the letter contained within each module. Following that, the program presents various screens with the menu choices, and some of the screens become quite cluttered with several different windowed sections containing quite a bit of coded data. One of the difficulties with this program is that it does not give descriptions of all of the coded data in every screen and it does not allow one to easily look at those descriptions; therefore, the user must either refer to the manual or have a fairly good grasp of what different codes mean. For example, in developing a profile, numbered codes are laid out under the different descriptors. In the case of temperaments, the codes are laid out over letters D, F, I, J, and M. The user, therefore, must remember what those different temperaments are in order to recall what they are looking at or changing. There are sections in Ultramatch and UltramatchPlus modules which define all of those codes and information, but it is annoying to have to maneuver to that part of the program to look it up each time. Overall, however, with a little practice, the users quickly learn which of those is important and can easily work their way through the different functions.

LIFECORP utilizes the Sentinel Protection device which is a piece of hardware that is plugged in to the parallel port and has a connector on the backside of the plug to which the printer cable can be connected. The program can be run at only the site where the Sentinel is located. The Sentinel can be programmed to stop the program from functioning after a certain date if that is desired by the developer.

Documentation

LIFECORP comes with an extensive manual that explains every one of the modules in a great amount of detail and is quite helpful to the user in learning the program. The manual has a good table of contents and index and is easy to utilize in finding information. Unfortunately, the program does not have on-screen help which would be a nice touch. An "example" client is built into the system and is followed in the manual to demonstrate different functions. The appendix contains information regarding the different DOT codes as well as other coded data. This can be helpful when interpreting information.

Hardware

LIFECORP runs on an IBM PC or compatible microcomputer, running under the MS-DOS operating system. It requires a minimum of 10 megabytes of hard disk space if only the Ultramatch is used and can take up to 30 megabytes if the entire program is loaded.

Cost

The modules contained in LIFECORP are purchased separately. Some of the modules would require the use of others in order to have them function correctly. The module prices are as follows:

UltramatchPlus	$1,095
Ultramatch	595
Test Conversion Analysis	1,895
Residual Functional Capacity Analysis	2,495
Competitive Employment Analysis	995
Job Description Writer	595
Transferable Skills Analysis	495
Employability Access Analysis	495
Local Job Bank	395
Local Labor Market includes one free database with additional databases costing $55 each	395
Human Resource Bank	795
Careers 2001	2,500

The purchase price includes help with the installation and initial use and customer support.

McCroskey Transferable Skills Program (MTSP)
McCroskey DOT Program (McDOT)
McCroskey Test Plot Program (McPLOT)

Version 6.2 Updated 3/92

Precis

The McCroskey Transferable Skills Program is a continuation in the development of a job match system (previously Datamaster) by Dr. Billy McCroskey, which incorporates his notion of a vocational quotient composed of factors that determine the complexity of a job or a person's profile and the level of job complexity at which they can expect to perform. It utilizes selected Dictionary of Occupational Titles (DOT) factors in its transferable skills approach and relies on Employment Service databases that indicate the most frequently available jobs in a particular state, counties in Mid-Western states, or the nation, and produce a preinjury and postinjury search comparison useful in vocational expert work. It also contains databases from the DOT, Occupational Outlook Handbook, and Social Security Administration. The program is unique among the job search programs in a number of ways including the definition of transferable skills, the development of a Vocational Quotient, factor numbering, and inclusion of local area wage and inflation weighting factors in predicting job salaries. Beyond the search program, there is a DOT definition look-up program (McDOT) and a test conversion program (McPlot). Strengths include its theoretical base, database concept, multiple databases, and reasonable cost compared to other similar programs. Weaknesses include the complexity of the program, lack of DOT vocational-coded factors in McDOT, the requirement to search only with McCroskey's logic in the search process, and lack of integration among the three programs. Cost of the system is $3,195 and it is available from the developer only.

Introduction

The McCroskey Transferable Skills Program (MTSP) and companion McCroskey DOT Program (McDOT) and McCroskey Test Plot Program (McPlot) are the most recent evolution of the former Datamaster program developed by Dr. Billy J. McCroskey and programmed by Dr. William Wattenbarger. These are three separate programs that complement each other in that they are used in sequence with the output from the first two used in the search. They are not, however, integrated in the sense of being one seamless computer program. The purpose of the MTSP is to provide a job-matching system based heavily on the client's employment history using the trait-factor job-person matching approach. An "equal to" or "less than" logic on the worker trait factors is used in the search. The search is further based on developer McCroskey's formulation of a Vocational Quotient (VQ) or index of job difficulty, which can be used to identify appropriate jobs. When jobs are listed after a search, the program lists them in order of complexity (VQ) to which the person's VQ can be compared to ensure clients are not underplaced. While the program is aimed at disabled adults with a work history, it can be used by persons with no work experience by entering a worker profile based on tested or inferred abilities such as aptitude, general educational development level, strength factors, or medical functional limitations. The MTSP utilizes a preinjury/postinjury search function useful to vocational experts in quantifying the effect of injury on a job seeker's employability (labor market access loss). It also has a counselor orientation printout of the program findings oriented to the client. MTSP searches can be run on a separate database available for each state from the State Employment Service's Work Orders; a national database containing the most frequently hired for jobs; the entire DOT database; all jobs listed in the 1990-91 Occupational Outlook Handbook; or the Social Security Administration's list of 1600 Light and Sedentary entry-level jobs. Unlike many other job-matching systems that developed their database solely by sampling the DOT, the MTSP's default search utilizes the most-frequent-hired-for jobs within a state based on the Office of Employment Service statistics. Because of this, the database for each state differs in size. McCroskey makes the argument that two-thirds of all positions in the United States are represented by 420 specific jobs. He applies this logic to 2,056 selected jobs that are utilized in this program and that represent 95% of all positions listed through the employment service. The manual states therefore, that over 10,000 of the job titles in the DOT are not available in significant numbers in any region of the United States. Thus, most other job search programs using all the titles produce a long list of job titles that are not readily available. The MTSP utilizes the VQ to order the list of transferable skilled jobs as one of several options for listing the jobs found after a search. The transferable skills search utilizes factors including but beyond the MPSMS and MTEWA on which some other programs base their search parameters to claim transferability. Some of the additional factors include Industry code, Census code, Occupational Group Arrangement code, etc. The MTSP also has a statistically derived prediction method to suggest worker wage capacity in the local area.

The McCroskey Dictionary of Occupational Titles (McDOT) companion program is a DOT look-up program in which a client file can be built from the work history or jobs looked up in the DOT. It does not, however, contain any of the coded information, and it strictly presents the narrative portions of the 4th edition DOT as updated in 1991. To derive the coded DOT data, the user is referred to McCroskey's companion publication The Encyclopedia of Job Requirements (1991). The coded data are also found in the MTSP. If a client profile is developed in McDOT, it can be saved to disk or printed. From the disk copy, the program can be loaded in a word processor for editing. In conducting a search, the DOT name and number must be manually entered in the MTSP before a job search. Another suggested use of the McDOT could be to group all DOT job titles and/or descriptions in a company under a report on the company.

The McCroskey Test Plot Program (McPlot) is the second companion piece to the MTSP and is designed to convert test scores from tests of aptitude, achievement, or ability to the vocational factors utilized in MTSP such as GED and Vocational Aptitudes. It also contains a rating section that allows the user to rate clients on Physical Capacities and Environmental Conditions. When this program is completed, a report is generated that shows the profile of the client that can be used in the postinjury search and is reflective of that person's vocational profile, i.e., GED, Aptitudes, Physical Demands, and Environmental Conditions. That profile can be immediately printed or loaded to an ASCII file which can be used by most word processors to edit before printing. This profile is then entered in the MTSP to become the basis for the post search.

Development

The McCroskey Transferable Skills Program (MTSP) is an evolutionary computerized pre- and postinjury labor market access program. It was derived out of the VDARE conceptualization on which Drs. McCroskey and Wattenbarger worked in the late 1970s while graduate students at the University of Georgia. They programmed a computerized trait factor matching program on the university's mainframe computer in 1979, making it the first known computerized job search program. Following the same logic, Datamaster 1.0 (1983) was developed and first used in Minnesota to identify person-job matches that were listed in order of "best fit." In addition to ordering jobs in terms of maximum vocational potential, the concept of "best fit" yields moderate to high positive correlations with individual interests, earning potential, job training requirements, social value of jobs, vocational potential, and overall job difficulty. Datamaster 2.0 (1984) increased the operating speed of the program and added the capability of extracting a list of best-fitting jobs for which an individual would have some levels of transferable skills. Datamaster 3.0 (1986) further increased the speed of the program and extended the levels of transferable skills from three to seven. These levels range from jobs for which a person has a low level of transferable skills, through a moderate level, to a high level. Datamaster 3.0 further identified a listing of person-job matches (i.e., level 0) for persons with entry level skills; these are jobs for which no transferable skills are needed. Datamaster 3.0 Plus (1987) added a series of supplemental features that enhanced the reporting capabilities of the program. Datamaster 4.0 Plus (1989) was an upgrade based on McCroskey's ongoing research programs. Finally, the newest version called McCroskey Transferable Skills Program was released in January 1992 and revised in March 1992. This update added the McDOT and McPlot which are developed in a version of Borland International's Paradox database program, utilize the same menu choices, and are menu-driven programs. The MTSP is programmed on a compiled version of Microsoft QuickBasic, version 4.0. Dr. McCroskey reports that he is currently working on the next update which will incorporate the expanded DOT factors in coded form in the McDOT, expand the search factors to the 72 variables being reported in the Department of Labor data, make all three of these programs run together in one seamless package, and will be a Windows-based program. The MTSP was developed by Dr. Billy J. McCroskey of Vocationology, Inc., and programmed by Dr. William Wattenbarger. It is exclusively distributed by:

Vocationology, Inc.
1821 University Avenue West, Suite N145
St. Paul, Minnesota 55104
(612) 641-0527

Comprehensiveness and Use

The MTSP report assists the individual in locating jobs within his/her transferable skills and prints a pre/postinjury comparison of labor market access, earning capacity, and availability. Transferability is determined by analyzing the individual's work history and/or vocational profile developed from testing, observation, and functional restrictions. The McDOT program is used in looking up DOT job descriptions and titles to input into the MTSP, and the McPlot is used to convert standardized psychometric tests and work samples and Physical Demand/Environmental Conditions into scores useful by the MTSP. When used with adults who have worked, MTSP identifies jobs within the client's previous experiences, abilities, and interest. The program has a number of unique twists not found in any other program. Dr. McCroskey's statistical talents are evident in the manual and logic of the program in that he uses a number of weighting factors for various parts of his program that are based on statistical analysis. For example, he develops a Vocational Quotient (VQ) for each job and person. The VQ is explained as an index of difficulty for the job which can be matched to the person's VQ, which is an index of the level of difficulty the person can handle in a job. The VQ was derived from his research while at Mississippi State University utilizing multiple regression analysis to determine which factors in the VDARE or U.S. Department of Labor vocational factor profile accounted for the person's ability to work certain positions. The manual does not share all the factor weightings which make up the VQ, but apparently these can be found in McCroskey's published research.

With the release of the MTSP, the VQ has been transformed to a GATB-like scale with a mean of 100 and standard deviation of 20. Apparently, the higher the VQ, the more complex the job; and the higher the person's VQ, the more complex work that can be obtained. He states that the VQ factor has been positively correlated with vocational interests, starting wages, job satisfaction, and job tenure. Another interesting deviation of his system is the use of only 21 of the possible 56 vocational profile factors. Thus, he discards the G,V,N vocational aptitudes (which presumably overlap with GED) and the Interest and Temperament factors on which he quotes a study which concludes they are irrelevant in determining transferable skills. In predicting wages, he uses a weighting factor called the Earning Capacity Link Relatives (ECLR) to regionalize the wages to the state level and, in some states, the county level by each of the ten DOT occupational groups. The ECLR were calculated based on the ratio data on Per Capita Income Averages extracted from the U.S. Department of Commerce's Survey of Current Business. He borrows from the field of economics to use an indexing inflation factor for wages using 1991 as a base year. With these weightings, he found a correlation coefficient of .84 between the earning capacity predictions from the program and full-time job salaries in 1988, 1989, and 1990 on 200,000 job openings in Minnesota and Michigan. In his study, he used only the ten single-digit occupational categories from the DOT and found higher correlations within those large categories. Lastly, the MTSP has put all the coded vocational data on scales in which the higher number is more complex or difficult. For example, a transformation is made in the Vocational Aptitudes whereby a 5 score means the top 10% of the population in this program.

The user first enters the client's job history in the MTSP. The DOT codes and trait values for each job can be taken from McCroskey's book, Encyclopedia of Job Requirements. However, the McDOT program is most likely first used to find the exact DOT title and number. This is done by entering a partial title or number, and the program searches one match at a time or produces a list of all matches. These can be reviewed and the appropriate job selected and stored in the client's work folder. Once all jobs have been selected in the McDOT, the client file is printed or saved on disk to be edited. The McDOT program is exited and the next logical step is to enter the McPlot to develop a vocational profile based on testing and observational data. A list of tests is contained in this program, and the person's percentile score is entered on the tests which have been given. McPlot contains a list of standardized tests and work samples with conversion scores built in; however, it can be appended with other tests if the results can be converted to a percentile score. Once test percentiles are entered, the program assigns weightings on the scores to the relevant vocational profile area such as GED level or specific aptitude level using the McCroskey numbering scheme. A graph of client abilities from test results can be displayed but not printed as part of the report writer, and a vocational profile can be printed or saved to disk to be edited later. Once exiting the McPlot, the user starts the MTSP and builds a client file in which the DOT jobs are entered producing a preinjury profile of maximal abilities that can be modified. A postinjury profile is developed based on McPlot data and medical limitations. These two profiles form the basis for the MTSP search of any of the databases. The pre- then postsearch is run in sequence and takes about five minutes on a 386/20 computer if utilizing the 2,056 most frequently hired jobs database. Following the search, the user can select the report desired and print it or have it put on disk for editing. The report has a few customizing features and tends to provide a wealth of information (whether desired or not) resulting in a 20-page report on a typical vocational rehabilitation semiskilled worker. It can, however, be edited in the word processor before printing or, as an option, much of the explanatory text can be turned off before printing to save redundancy from one printout to the next.

There are three unique features that cannot be overemphasized in the MTSP program logic and operations. First, the program selects only those traits that are considered critical for job placement: GED, eight Aptitudes, Physical Demands, and Environmental Conditions. The Aptitude profile has been shortened; Aptitudes G, V, and N are not considered as separate Aptitudes, but are subsumed by the three GED components: Reasoning, Math, and Language. Secondly, although based on the DOT data tapes, McCroskey has made considerable changes in the structure of the variables. Aptitude scales are reversed so that the higher numbers always represent the higher scores. Finally, the VQ (Vocational Quotient) scale is a composite difficulty rating or level given to each occupation in the DOT based on a multiple regression study of each trait for each job. In using the MTSP program, it is possible to establish a VQ level that will select jobs that are within the client's ability range. This prevents the selection of jobs for which the client is overqualified.

In using the MTSP, the screen is divided into three sections horizontally called windows. In the first section, the client information is entered or loaded from a previously built file. This would include age, education, and rehabilitation provider. The type of database on which to search is selected, as is the sort index which is defaulted to VQ. Once those decisions are made, the user goes to the Work History window and enters the work history by DOT number previously determined. The program lays in the Job Title, RML levels, S P Q K F M E C levels, Physical Demands, Environmental Conditions, VQ of the job, and GOE number. Of interest, the strength levels do not make use of the expanded physical demand factors in a direct way although choices such as 0 = none to 1/3rd of the time and 1 = Frequently/Continuously are given. Once the work history is entered, the last window is entered containing the Vocational Functioning Profiles. Thus, the maximum abilities from the work history are automatically inserted, a line is available to put in the maximum abilities based on an evaluation, and a pre- and postinjury line is built which can be altered. At this point the search is run. The program makes extensive use of the Function keys so that <F1> takes the user to the help screen, <F2> loads a client, <F3> gives a directory of clients, etc.

Utility

The system is designed for use by vocational experts, vocational evaluators, placement specialists, school counselors, and rehabilitation counselors whose case load is disabled adults with an employment history. It is not intended for direct client use. Its major use appears to be in worker's compensation, the personal injury field, vocational-technical institutes, and vocational rehabilitation.

Since a major MTSP database was derived from an analysis of the most frequently hired for jobs at both state and national levels, the results of the searches with these databases should give a list of real jobs in the local area and minimize jobs never or rarely encountered. Selected jobs can also be deleted, and jobs in the database can be modified to reflect changing requirements.

User Friendliness

MTSP is not for the faint of heart. One reviewer described it as a tough system to learn that initially leaves the user in a daze. To give an example, the printed report gives an index of pre/post job availability. Availability is described on the report as "Pre-Post Indices of Employability Dispersion relative to the representative spread of VQs in the specific RLMI used for this analysis." While this definition and others like it probably seem simple to the developer, they are confusing to the new user. The manual is also difficult to follow in that any specific type of information is scattered throughout the manual including the Table of Contents; therefore the manual needs careful study before using. Dr. McCroskey indicated that the manual was made to be redundant since users tend not to utilize manuals or may start reading at any place. To the new user, the program is not easy to follow, and the user constantly has to make references to the manual for clarity. However, once the system is understood, it becomes progressively easier, and an experienced user should breeze through a job search. There are, however, several distressing features in the program. In McDOT, often the user wants to determine the relative skill level between two DOT titles, but without the coded vocational profile information in the McDOT, other sources have to be used. Secondly, the ability to store only one client at a time in the report format is a limitation as is the awkwardness of having two programs with data used in MTSP but which are not physically connected in the computer. Therefore, the McDOT has to be used, a report printed and exited; then the McPlot used, report printed and exited, then the information from these two have to be re-keyed in MTSP before the search is run. This is not an insurmountable barrier but is certainly not as convenient as other programs in which all functions are done in one program. These problems are being addressed in the next revision. On the positive side, the three programs contain Help screens that explain the program and lead the user through the program. Particularly useful is the McPlot help feature that does a better and more concise job of overviewing the entire program than the manual. On a further positive note, the manual is lengthy and contains a wealth of information about the system.

Documentation

The McCroskey programs are delivered in several small boxes of High Density computer disks and come with a 170+ page manual in an 8.5" x 11" loose-leaf three-ring binder. The manual is full of information and should be thoroughly studied before loading or using the program. A small but nice touch is that the disks are shipped in plastic disk boxes so the user can keep them together after loading. The installation procedure is simple enough, and the program creates its own subdirectory to store files and uses the shareware PKUNZIP program to decompress the disk and load it on the hard disk drive. It takes about 30 minutes to install.

Following installation, the program can be called up using one of the created batch files by typing either MTSP, McDOT, or McPlot.

Hardware

The programs require an IBM or compatible microcomputer with 30 megabytes of hard disk space, a Floppy disk drive, VGA Color Monitor, MS DOS or IBM DOS Version 3.3 or higher, Version 5.0 or higher is highly recommended with 550 free bytes of conventional memory.

Cost

Cost of the system is $3,195 for the three programs and manual (less for those who have a previous version of Datamaster).

Dr. McCroskey reports that he offers a day of free training with CRC/CIRS credit to any purchaser who will come to his office in Minnesota. He also offers unlimited phone consultation. Updates have appeared in the past on the average of a little over one every two years and are expected to continue at the same rate.

OASYS: The Occupational Access System

Precis

The OASYS job match program is a multifaceted and comprehensive set of program and database modules that can be utilized to match a job seeker's characteristics to national or local jobs; determine wages for various jobs; develop job analyses matching ADA requirements and Dictionary of Occupational Titles (DOT) format; browse job-related information; determine job growth trends at the national, state, or regional levels; determine job seeker deficiencies needing remediation in relation to a specific job; or determine area employers for matched jobs. Primary job match databases include either the DOT database of full job descriptions with all the expanded coded job data or user developed local job data in the same format. The program allows job match searches by four different approaches from a transferability of skills search of only job titles with the same MTEWA and MPSMS as previous jobs to a more open approach of the entire database. The job match searches can also be filtered by parameters such as Guide to Occupational Exploration (GOE) interest codes or Occupational Aptitude Pattern (OAP) codes. Advantages of the system include quality of the programming and manual, inclusiveness, versatility, help screens, continual development and updating, transferable skills approach, system support, and ability to purchase system modules desired. Disadvantages include higher cost compared to less inclusive job search software, time needed to learn the program, and expertise needed to appropriately utilize the software. Basic system cost is $4,450 plus a $360/year updating fee. Volume discounts are available.

Development

The OASYS (or Occupational Access SYStem) is designed to allow users to chronicle a job seeker's work history and ability profile; to browse the databases provided for occupational exploration purposes; to develop a composite client profile based on a transfer of skills analysis; and to match a job seeker's ability profile with job requirements listed in the DOT or developed from local job analyses. In addition to being a job search program, OASYS can be configured to contain databases on a variety of job information such as national and state employment projections, local and national wages, local employers, work fields, GOE interest, Product Codes, Holland Codes and others which can be crosswalked. The OASYS was developed by VERTEK, Inc., located at 555-116th Avenue NE, Suite 118, Bellevue, Washington 98004 and is sold through a regional sales force. Phone: (206) 455-9921. The system is updated at least once per year (for users paying the yearly maintenance fee) by sending additional disks to the users which are installed over the existing program. The software is programmed using the C programming language. Job Match Version 1.3 is reviewed here.

Comprehensiveness and Use

OASYS provides a multifaceted, powerful program to gain an exhaustive amount of vocational information and to search that information by a variety of user defined methods. The OASYS consists of a feature laden job search software program with several add-on, extra cost modules to expand and customize the basic functions. For an additional price, for example, the user can select the OASYS+ program module which adds information from the user's State Office of Employment Services on job projections of DOT jobs and average wages by state and county areas. A second extra cost option is the Job Match program. Job Match contains the basic OASYS and a separate database structure to allow the development of a local employer database in which is built job descriptions and allows the search of jobs in the local area by job seeker. These local job descriptions can be built from up to three DOT job titles or from scratch with the aid of an OASYS job analysis form. With any of the programs, the user can request information on local employers by zip code for DOT job titles recommended, and the developers will provide that information for a small fee per employer contact name. Finally, a Holland Occupational Code module can be purchased that allows the search to be filtered to find all occupations in the DOT related to a three-letter Holland Code, which should be immensely useful for vocational counseling.

The multiple databases provided by the OASYS are extensive and include the DOT, Employer Job-Bank, Job Seekers, and National Employment Outlook databases. The DOT database includes the DOT title and code number, occupational group arrangement (OGA); occupational aptitude patterns (OAP); work fields (MTEWA); materials, products, services, etc. (MPSMS); industry codes; Guide for Occupational Exploration codes (GOE); Census codes; SOC codes; OES codes; Holland Codes, as well as the Specific Vocational Preparation (SVP) number, Aptitudes, General Educational Development (GED) levels; 14 Environmental factors; 20 Physical demands; Situation codes; and Data, People, Things codes. The Employer database includes the Standard Industrial Classification (SIC) codes and is organized by zip code. The Job Bank database allows the user to browse through the Employer database by SIC and Zip codes; browse through the Job Bank database by wage range, open or closed jobs, employer job title or code, zip code and SIC code; a browse through the Seeker database by seeker job ready status, counselor name, and Zip code. In search or browse mode, most of the aforementioned factors can be modified, utilized, or not utilized in the search process making the database searches infinitely capable of being customized.

The Job Bank Database (extra cost) allows the inclusion of local job information about wages, job status, employer job title or code and SIC code. The user can peruse the Job Bank Database using any of the descriptors or a combination of the seven; however, the user has to develop this information and input it into the system. The Seeker Database allows the user to survey job ready seekers as classified by job ready status, counselor name, and zip code.

In using the OASYS-Job Match System, the transfer of skill process consists of building a job seeker profile based on work history. Those jobs in the work history contain information on work activities a person performed in previous jobs (MTEWA) and the objects upon which the work activities were performed (MPSMS). This information is then used to identify jobs that the person can now perform utilizing those same or similar work activities and work objects. This methodology defines transferability of skills according to the Social Security Disability regulations and assumes that individuals who match on jobs with the same MTEWA and MPSMS will have the skills to perform the jobs. In practice, this approach has the drawback of selecting many overly specific jobs which are unknown in the local job area or appear of questionable validity, a problem OASYS shares with other users of this methodology. When appropriate jobs are selected by this process, however, they are jobs which should require little additional training time for the job seeker.

The user must complete a series of steps prior to performing the actual skill transfer analysis. The first step is to open a job seeker file which involves entering identifying information about the seeker or client. The user can enter information such as the person's address, phone numbers, wage and hour preferences, job ready date, as well as the counselor's name and phone number. This section also allows the user to add comments about the client and keep track of when the record was first entered and the last update. After setting up the seeker record, the user enters the client's work history which builds a worker profile based on the minimum and maximum coded information from the jobs performed. For example, it might indicate the worker had shown the ability to work from the Light to Heavy strength levels based on previous employment. If the job seeker has no work experience, the worker profile can be built from scratch based on test data, or the profile can be altered at will on any factor including leaving factors out of the search parameters.

Entering the client's work history is, therefore, the second step in the process leading up to performing a transferability of skills analysis. The user enters each job title individually. The user is able to examine a description of each job and a list of similar job titles listed in the DOT before selecting the correct one. A handy feature in this process is that when a job title is input, all job titles with that word in any of the name or descriptions is presented from which to select the correct title. Therefore, the user does not have to get the exact name sequence as it appears in the DOT to have it listed. If there is difficulty finding the exact job title, the program allows the user to browse the data in a number of ways. For example, all the jobs within a certain industry can be reviewed to select the correct one. Once a job title is selected, it is stored in the job seeker's file and the process is continued until all jobs have been entered. Next, the user is ready to view the composite picture of the client's skills and abilities. An initial adjust screen allows the selection of specific factors to be changed before the following screens are shown which is a helpful time saving step. Then, screen by screen, the ranges on all the variables and skills required on the client's previous jobs are displayed including specific vocational preparation, educational skills, physical demands, environmental conditions, work situations, work activities, aptitudes, work functions-data, work functions-people, and work functions-things are displayed. This information can be displayed in coded form, with a brief description, or with the full text narrative description. The user is then able to adjust any of those variables to more accurately characterize the client's present functioning.

Once those steps have been completed, the user is able to perform the job search based on the transferable skills profile. There are four types of searches with each reflecting a different level of skill transfer. The Primary Skill Transfer (Search) directs the OASYS-Job Match System to search the DOT database for job titles with the same MTEWA and MPSMS codes. The Secondary Skill Transfer (Search) instructs the OASYS-Job Match System to search the DOT database for job titles with similar MTEWA and MPSMS codes. The Composite Search directs the OASYS to search for job titles with both similar and the same MTEWA or MPSMS codes. The Extended Worker Trait (Search) instructs the OASYS to perform a search that ignores the MTEWA and MPSMS codes. Each search results in a listing of the number of job titles fitting into each category along with a listing of the job titles and DOT code numbers. That listing can be edited to include or exclude jobs in the final printout. Because the first three searches do not look at all job titles in the database, they can be done in a matter of seconds, and the fourth search which does search all the job titles does so in a matter of several minutes making this program a pleasure to use due to its quickness.

The user can further tailor the search to meet specific needs by using the Focused Search option. This feature allows the user to limit the DOT searches to select job families or to limit the searches of the Job-Bank to employers/jobs within certain SIC codes, ZIP codes, and/or wage range. The job families on which the user may focus the DOT searches are: GOE, OAP, MTEWA, and/or MPSMS. Other features of the system include the ability to browse through any of the databases or to compare a job seeker profile with a specified job or vice versa. This latter feature indicates on which parameters the person is qualified, underqualified, or overqualified and could be important in counseling individuals on areas needing improvement before looking for a certain job.

The setup of the OASYS allows the user to customize at almost every step. Searches, Job-Bank Databases, Employer Databases, and the Seeker Database can all be customized to meet the specific needs of the user or the client. The versatility of the OASYS is one of its major selling points and comes from its ability to be customized, to crosswalk between codes, and to be used with other vocational evaluation tools. Throughout the program, the various codes employed by the OASYS are explained in detail on the screen so that the user does not have to remember what all the codes mean.

Utility

The OASYS has the potential to be a useful tool for many professionals in the rehabilitation and job placement communities including vocational consultants and experts, vocational evaluators, counselors, placement specialists, disability determination experts, insurance claim managers, occupational analysts, vocational educators, labor union personnel, ADA compliance professionals, etc. It encapsulates information from numerous sources utilized by these professions and should greatly enhance their job knowledge. The OASYS is a valuable resource for these professionals because it allows the user to access the information available in various Department of Labor publications and other places easily and quickly in one source in which information can be crosswalked between codes. In addition to keeping information on job seekers and searching various databases for specific jobs, the system can be used to compute a loss of access to the labor market by running a preinjury and postinjury search and comparing the results.

User Friendliness

The OASYS is shipped via UPS and consists of a manual and a number of computer disks that are loaded on the hard disk drive. Installation instructions in the manual are laid out step-by-step for ease in reading and completing. Information is entered in a sequenced fashion beginning with the client's identifying information. Next, the client's work history is entered followed by the adjusting of the client's ability profile (if necessary) and running the job search. As the client's ability profile is entered or adjusted, the OASYS provides descriptions of all codes and occupational variables at the bottom of the screen. The OASYS is a menu-driven program. All functions are listed at the bottom of the screen and are accessed by inputting the first letter of the command desired. The OASYS has a help key which is accessed by depressing the <F1> key on the keyboard. The help screen tells the users where they are and what to do on that screen and gives the users comments about the process. On data screens, the <F1> key provides a detailed description of the coded choices.

The OASYS allows the user to print any list or information developed or accessed by the system and can be done at any screen or from the PRINT menu selection. The user can specify the level of detail desired in the printed information. The program is both attractive in appearance and function and quick in execution of the searches. Screens present in the OASYS program are clear and attractive. They present all the basic information without overwhelming the user. There are always help screens within a finger's reach if the user becomes confused, and the screen cursor moves to the decision points on the screen indicating where input is needed.

Finally, the program follows a series of embedded menus in which the choices are consistently presented, the escape key takes you back to the selection option, and there is a RETURN option to back the program up to the opening menu.

Documentation

The OASYS job match program provides an extensive amount of system information in a manual that is professionally printed and includes a Table of Contents and Index for ease of looking up information. Data is presented in a step-by-step "how to" approach which is clear and easy to use. Other systems could learn from both the comprehensiveness and usability of the manual used by this program. A particularly nice feature in the manual is a full description of the various assumptions made by the program or databases utilized. For example, the transferability process used in this program is thoroughly explained as is the limitation on the OES data on wages based on the national data available.

Hardware Requirements

The OASYS runs on an IBM-PC or compatible microcomputer running under PC-DOS or Unix operating systems or on a network. It requires 640K bytes of RAM, approximately 20 megabytes of hard disk space, a floppy disk drive (either 5.25 or 3.5 inch), and PC-DOS or MS-

DOS, Version 3.0 or higher on the DOS based operating systems. The developers indicated they will work out custom installations for persons wishing to put it on a network or other special applications.

Cost

The initial cost of the basic OASYS System is:

Basic Entire System:	$4,450
Adding Employer Job Bank with OASYS Job Match:	$1,545
OASYS Plus:	$ 995

The purchase price includes on-site training and phone support for a limited time. Additional support is $360/year and provides phone support and free updates to the system of which a major update is produced yearly.

Realistic Assessment of Vocational Experiences (RAVE)

Precis

The RAVE is a comprehensive job-search program using the Department of Labor database or a custom-developed subset of that database. It has a different and more inclusive philosophy on job search methodology than other programs, which may be it's major strength or weakness. It is advertised as a program for use primarily in career counseling. Accessing jobs requires building a worker profile through entering jobs using a narrowing process from a keyword search of titles. When searching, the program uses an averaging process of a number of codes and finds the 60 best fit job titles that are given a "Goodness of Fit" code from 0 to 100. The output jobs found in the search are then printed in order of the fit based on the 100-point scale. The program does not allow the printing of all matches so it cannot be used in a preinjury/postinjury job title comparison to determine labor market access loss. RAVE is to produce a Version 3 for the vocational expert that allows the user to alter the standard search philosophy of RAVE to the demands of the user and will calculate a labor market access loss. In the standard program, however, its unique averaging process often includes potential jobs which other programs would eliminate due to some factor from the Dictionary of Occupational Titles (DOT) being too high. It also features a state database of employers by city and industry for the selected jobs. Lastly, the new version allows the DOT data to be reviewed or looked up for information purposes. The program is available from American College Testing of Hunt Valley, Maryland. It can be run on IBM-DOS or MS-DOS systems and can be configured to run on a network.

Introduction

RAVE Version 2.61 represents a progressive improvement over previous versions of this program in that it incorporates the 1991 DOT expanded data and also has become much easier to use. The program retains its different philosophy of job search to enable users to identify *realistic* occupational options for adults forced by disability or unemployment into having to change jobs. The developers believe that, in traditional search strategies, too much importance is given to exact matches on the multitudes of codes related to the client profile. Thereby, some insignificant factor may eliminate a perfectly reasonable job selection. They designed three search methods to get at those best fit jobs, and RAVE incorporates its own job codes and specialized database on one search method to allow a more inclusive look at potential jobs within the client's abilities. The program makes use of client descriptors and recommends judicious use of eliminators to find jobs.

In the first departure from other job search programs, RAVE averages the levels of job factors such as the Data, People, Things factors from previous jobs. In building a worker profile, other programs take the highest level of abilities displayed; however, the RAVE approach is to take the most usual level of abilities. The program then asks what job in the client work history is the one most preferred. The ability profile from that job is doubled before the averaging to weight the final profile in its favor. In its first search mode looking for "Closely Related Occupations," RAVE searches the DOT database looking for jobs that match on either Industry/Work Fields or Materials, Products, Subject Matter, and Services (MPSMS). Eliminators of job titles in this search mode include physical demands and working conditions. It is felt that jobs identified with this matching scheme allow transferable skills and will require less retraining to perform them.

If no suitable matches are found with the previous method, RAVE has a second search type to "Search for Realistic Alternatives." In this search, the client information is utilized to search a custom selected subset of the DOT data of 2,500 occupations that are in constant supply across the United States, do not require highly specialized training to access, and are not jobs which require a long previous career ladder to access. This custom set of jobs also contains some new and different coding factors related to vision, hearing, lifting, and walking and/or mobility. To begin this search, unrealistic jobs are first eliminated based on the client's physical or emotional limitations and training level. The program then selects the top 60 scoring occupations for inclusion. To score the occupations, each attribute of the occupation is compared to the same item for the client. If the occupation matches that attribute or is one level lower, it is given 3 points. If the occupation is one level higher or two levels lower, it is given a score of 2 points for that attribute. If the occupation requires a certain attribute the client has not displayed, 0 points are given. Eventually, all these points are added together and converted to a percent score to come up with the 0 to 100 scale for each selected job.

If suitable jobs are not found with this second method, the user can then search the occupations which were eliminated based on the physical demands or working conditions to determine if any of those occupations would be considered suitable. These jobs are recommended when the user believes he/she might find an unusually supportive employer or could eliminate physical problems with assistive devices. It is recommended that this search be used only with difficult to place clients such as those with multiple disabilities, poor education, or problems using the English language. Following the search, the program allows the user to compose the report and eliminate occupations which do not fit.

Development

The program was developed by The Vocational Resource and originally copyrighted in 1988 and 1990 by developers Peter Block, Norman E. Corson, Donald Mayall, Marilyn Maze, and Marvin Musick. The manual explains that RAVE is designed to identify occupational options for adults in transition. The program is based on the occupational information developed by the U.S. Department of Labor over the past forty years. This data includes definitions of 12,741 occupations included in the revised 4th edition of the DOT. The version reviewed (Vr. 2.61) is the newest release in 1993 and can be enhanced with the addition of statewide employers for selected jobs. Version 3 is designed for vocational expert usage in courtroom testimony and is not reviewed here. The product carries a warranty to be free of defects, but no other warranty is given. It is now sold and distributed by:

American College Testing
ACT Educational Technology Center-East
230 Schilling Circle, Suite 350
Hunt Valley, Maryland 21031
(410) 584-8000

Comprehensiveness and Use

The program is menu-driven and presented in simple uncluttered data input screens with clear choices. The **Enter Client Information** screen choice is the first one highlighted on the opening menu; it leads to a screen which asks for first name, last name, ID code, and then automatically puts in the processing date. From there, the next screen asks for input about the client and inserts the client's first name into the instructions. To summarize a person's work history, the program searches the job titles in the work history by inserting two keywords. It informs the user of the number of job titles which contain the keywords, and when the list is short, the user looks at the selected titles to determine which is the correct job. Another way to get at jobs in the work history is to use the second volume of the manual which contains all DOT jobs listed in alphabetical order with their DOT code number. In the program, the code can be inserted to identify the job. For example, in using Diesel as the first keyword, the program indicated there are 25 job titles starting with Diesel. Those 25 can be listed and the correct one picked or GOE interest area, Industry, and DOT number can be listed which successively cuts down on the number to look at before choosing the correct one. At any point in this process, the job title definition can be pulled from the DOT by using one of the Function <F3> keys which also gives the DOT number, GOE number, Industry designation, Data-People-Things codes, GED codes, Aptitude codes, etc.

Once the jobs are entered in the work history along with a code for experience, the user is asked to pick the job which is closest to what the worker prefers now. A worker profile is developed which gives the name of each code level and the level of each for the separate jobs and an average level. Therefore, for a job with two 2s and a 6 for DATA, the average is 3. For one with three 8s and a 6, the average is 8. The search is then performed using the averaged worker profile. This feature is unique to the system. In looking at the coded information from the DOT, the amount of definitions listed can be customized from code only to long definitions. Also listed are Eliminators, which are fields of information that are used to eliminate jobs in the search. They include Academic Demands, Physical Demands, Stress-Related Demands, and Work Environment Demands. At any of these points in the process, the file can be sent to disk, printed, the format changed, or escaped from by selecting <ESCAPE> which backs the user out of the system.

In the "DESCRIBE CLIENT" menu option, the old profile of average ability is displayed, and a new profile can be made by altering the old one to give a residual ability profile of codes. Under Eliminators, the user is instructed to pick a number between 0 and 4 to describe any limitations. Therefore, on vision, 0 = high, 1 = limited, and 2 = blind. On lifting, the range is 0 = very heavy through 4 = very light.

Menu item three is to search for CLOSELY RELATED OCCUPATIONS. The instructions tell the user that this search looks for occupations from the 12,741 job database that could be entered with little or no training. There are two steps: 1) eliminating jobs which are not realistic based on work environment and physical demands, and 2) scoring the remaining jobs based on SVP, Industries, Work Fields, or MPSMS. Therefore, Physical and Work Conditions are first eliminated, jobs around the same SVP are chosen, and a match is determined on one of three descriptors: Industry, Work Field, or MPSMS. The manual relates that scores for these occupations are multiplied by the SVP score to be sure the occupations are close to the previous educational level. The 60 highest scoring occupations are included. The search takes only a few minutes.

Listed jobs can be included or deleted from consideration. Listed with each job is the DOT number, Name, Industry, Physical Demands, Environmental Conditions, RML, SVP, Aptitudes, Temperaments, GOE number, and a score from 1 to 100 of the "Goodness of Fit" with the best fitting jobs listed first. The search of a Diesel Mechanic, Auto Mechanic Apprentice, Commercial Cleaner limited to light work with no climbing or bending identified jobs with a high score of 100 through a low score of 37. Scores in the 40s and 50s prevailed. The top job was Vehicle Fuel Systems Converter who converts vehicles from gasoline to butane gas operation. The program indicated the realistic score was 79 on this match and the closely-related score was 100. In a listing of matches, the program showed matches on the various factors from Yes to Almost to Somewhat to No. The next several jobs which apparently were also good matches were Service Manager (89), Auto Repair Service Estimator (67), Carburetor Mechanic (67), and Taximeter Repairer (67).

The next menu choice allows a SEARCH FOR REALISTIC ALTERNATIVES that looks at a set of 2,500 occupations that have been hand selected by the developers to reflect jobs that are in common supply in the labor market and can be entered with little training or experience in that area. However, it is noted in the report that jobs listed on this output could require significant retraining. Jobs in this list had SVPs from 7 to 4 and fit scores of 86 to 70. The top five jobs for the Diesel Mechanic restricted to lighter work included Carburetor Mechanic, Test Driver, Electric Tool Repair, Electrical Appliance Repairer, and Gas Welding Equipment Mechanic.

The next choices of a search are the eliminated occupations that tended to be jobs that required heavier strength or previously eliminated physical demands at the upper end. Their fit score ranged from 95 to 78 and contained some possible jobs such as Parts Scavenger and Small Gas Engine Repairer. The top five jobs included Front End Mechanic (eliminated by the requirement of bending), Air Condition Mechanic (eliminated for medium strength and bending), Auto Radiator

Mechanic (medium strength and bending), Brake Repairer (medium strength and bending), and New Car Get Ready Mechanic (medium strength and bending). The sixth menu choice allows the viewing of specific occupations while the seventh allows the composing of the report. Available on Version 2.61 are state employer listings. Once a job is chosen, employer listings are searched by the industry and city, and a list of suitable employers is printed. This is an excellent new feature which should prove of benefit in advising clients of specific places to look for employment.

In addition to the regular search features, RAVE offers a phone-in or write-in service for processing clients. RAVE also has a Job Analysis Form which can be printed with the specifics for each job in the DOT and can be edited by the analyst.

Utility

This is a program for determining the "best fit" choices for individuals with a work history needing to make a change. It is especially suited for rehabilitation clients and should work well for them. It could be particularly useful in counseling, working with displaced workers, and Social Security or personal injury cases where jobs with transferrable skills are needed. It does not lend itself to doing a pre/postinjury analysis of job titles to come up with a labor market access loss and it is somewhat awkward to enter information on a client who has no work history from testing data, although it can be done.

User Friendliness

This program is intuitive in that the keyboard keys do what is expected of them, e.g., <ESC> takes the user back one screen and the <HOME> key sends the user to the beginning of a list while the <END> goes to the end. It is fairly easy to learn the program with the help of the manual. For an experienced job search user, this program can be learned in an afternoon. The "Goodness of Fit" approach is interesting in that it allows the inclusion of jobs which may be classified as "close" but not exact by the Department of Labor analyses. It allows the user to determine if jobs with qualifications around the one chosen appear right and does not summarily eliminate them. The scoring mechanism, which lists the top sixty matches, is a unique feature, although the program would be better if it contained an option of printing all the matches beyond the first sixty for each category. The program is menu-driven and easy to follow as there are not many screens to learn. The screens are, for the most part, simple and easy to read. The look of the whole program would be improved with color and a few bells and whistles which would give it a more unique look from other such programs. Graphics, for example, would improve the look of the program in changing screens and provide the user some information that the program is working.

Hardware

An IBM XT, AT, PS/2, or compatible, with hard disk and at least 512 kilobytes of memory is required. RAVE, Version 2.6 needs 7.3 megabytes of disk storage for all files.

Cost

Costs are determined by the type of system installation and features selected. The basic system retails for $2,895 for one installation and is reduced on multiple purchases or sites. RAVE can be configured to run on a network server.

System 2000

Precis

The System 2000 job search software is a fully functional system of modules to search the DOT database. It is designed to work with the Computerized Assessment (COMPASS) testing module which is an update of the MESA System from VALPAR. The Job Search program has several modules that allow keeping track of clients, jobs, client interest, and career-planning information. System strengths include its speed of operation and attractiveness of the screens, and weaknesses include having to return system hardware for upgrading and a paucity of information on how to conduct transferable skills search. The entire system, including the COMPASS testing module, sells for $9,845. System 2000 is distributed through a network of regional sales agents and was developed by:

VALPAR International Corporation
P.O. Box 5767
Tucson, Arizona 85703-5767
1-800-528-7070
(602) 239-1510
FAX (602) 292-9755

Introduction

System 2000 is the complete testing and DOT-based Job Search Software system first released in 1991 from VALPAR International Corporation. Revisions in both the Handbook for Analyzing Jobs and the Dictionary of Occupational Titles (DOT) have been incorporated in the present system.

Development

The stated purpose of the System 2000 job search software is to help provide for job placement, career exploration, and career counseling. The Computerized Assessment (COMPASS) Module is an evaluation tool specifically designed to be used with the System 2000. Twelve computerized subtests, three work samples, and two surveys comprise the COMPASS Module. (See COMPASS under work samples for a review of the testing module.)

Comprehensiveness and Use

System 2000 consists of eleven modules, ten of which operate as self-contained units. This modular approach allows users to purchase only those modules of interest, and to expand the system by adding other modules as needed. Operating as free-standing units, each module has the capability of gathering information and producing informative reports. The system also allows the modules to share data. For example, information generated by the COMPASS assessment can be used by the DOT search module. The System Manager is required to run all the modules and is central to the system. This module provides a common database of people and the integration capabilities. The modules attach to the System Manager and use it to share data.

The functions available with System 2000 include a people database, job database, work history, GOE interest survey, DOT database, DOT job descriptions, local database, PET survey, test conversion module, career planning, work sample scoring, and computerized assessment. The people database is considered central to the entire program. This feature allows each user to tailor the software to his/her specific needs. The system is entered by creating a file for the person in the people database. The DOT database includes the DOT code, job descriptions, worker functions (DPT), GED (RML), temperaments, aptitudes (G,V,N,S,P,Q,K,F,M,E,C), SVP, and the expanded physical demands and environmental conditions as found in the Department of Labor job analyses on the job titles published in the 1991 revised fourth edition of the DOT and in the Handbook for Analyzing Jobs. Both Physical Demands and Environmental Conditions are now reported on a 4-point hierarchy in contrast to the previous yes-no response. The factors can be taken as is from the DOT, modified, or totally changed to reflect more accurate information specific to individual need. In addition to the DOT data on every job, the program provides census codes, CIP code, GOE code, SOC code, MPSMS code, Industry code, and Work Field. In use, the System 2000 provides these data plus the DOT number, page number in the DOT where it can be found, and up to a 40-character title. Profiles are created by using 41 factors, compiled in 7 groups, to describe each job. In addition a 678 keyword index is included that will retrieve any job with the chosen keyword in its title. Apart from the job database, the program contains a people database which provides space for three different categories of information to be input. This includes demographic items, a DOT qualifications profile, and custom items.

Modules recently added to the system include The Local Database, DOT Job Descriptions, The Work Sample Scorer, The PET Survey; and TECO. The Local Database allows the user to construct and access a database of local jobs and training programs. DOT Job Descriptions supplies the entire text of the DOT to include all job descriptions. The Work Sample Scorer accepts results from VALPAR Work Samples and converts them to DOT factor levels. A facility exists in the module to convert user work samples and/or norm groups to a format usable by the program. The PET Survey is a paper-and-pencil measure that assesses abilities and preferences related to physical demands, environmental conditions, and temperaments. The Test Conversion Module (TECO) changes the results of popular norm-referenced tests such as ABLE, WRAT-R, GATB, TABE, CAPS, etc., to DOT factor levels.

Several search methods are available with the System 2000. In the Exact Match search, jobs are only chosen if a person's profile matches exactly on each factor specified. Data can be excluded on this search so that all people will qualify on the excluded factor. A Quick Check search can be run which provides a glimpse of the screen to determine how many matches are found and to allow the addition or subtraction of parameters to decrease or increase matches. The Quick Check report uses color to highlight job ratings that exceed, meet, or are below the search criteria. The other type of search mode is the Best Fit search that finds matches based on numerical ratings and a more extended range on the search criteria. Lastly, the program has a Browsing feature that allows the quick displaying of search results, the editing and sorting of the matches, or the selecting of matches to be printed by other reports. Within the search criteria, features are available that allow jobs to be displayed with increments in the client's abilities as specified by the user and/or the ranking of jobs according to the degree that they match the search criteria.

The People Database, specifically each individual, can be built as the user chooses; the names and order of the Bar Menu modules can be changed; a specific facility title can be added to the top of each report format; new modules can be installed at will; the menu colors can be selected from two choices; passwords can be chosen for each of the four levels; and the Utility Program allows for moving directories at any time.

Utility

The System 2000 job search program can be used by vocational evaluators, expert witnesses, job placement individuals, career counselors, and others interested in vocational data and searching jobs by transferable skills. The modular approach allows the purchaser to select only the parts of the system desired and enhances its usability.

User Friendliness

The System Manager must be installed first and leads the user easily through the installation process using a series of prompts that places the system on a hard disk. VALPAR provides the option to consolidate the System 2000 into a DOS shell or menu program by commanding it to position the System 2000 Program Directory as the current directory and then execute S2000.EXE. Once the System Manager is installed, System 2000 is started and the remainder of the installation is done through the UTILITY menu. The program also makes use of abundant help screens accessible with the <F1> key that facilitate the usage of the program. The <F1> key will, at most times, pull up a help screen, in the form of a window covering the right-hand side of the screen, that provides information about the current task.

A Bar Menu consistently appears throughout the program as the first line of the screen. Each item listed has a corresponding System 2000 module. The module being used has a main menu that is displayed as a window on the screen, while that module's name is in "inverse video" on the Bar Menu. The System 2000 therefore is basically menu-driven. The menu choices will appear in a window on the screen, and selection is made by the use of a "lightbar." Although many windows may appear on the screen, the lightbar will be in only one window at a time. The different windows that can be opened are all in different colors, which adds to the attractiveness of the program.

Printing the information displayed on the screen can be done at any time by pressing the print screen key. The information can also be compiled into a report and printed in one or more of four different formats: short form, search criteria, long form, and comparison. The user has the option of sending one or more of these reports to a disk file. This feature allows the reports to be accessed by the user's word processor.

The screens include a feature for "Auto Gray" and "Auto Color," to distinguish a window, which can be turned on or off to suit the user. Menu graying and different color schemes provide distinct separation.

Documentation

Seven manuals are provided, one for each of the following System 2000 modules: System Manager, Computerized Assessment, DOT Database, GOE Interest Survey, Work History, Career Planner, and DOT Job Descriptions. These manuals are comprehensive in nature, covering thoroughly all the options available for each module and are straightforward and easily understood.

Hardware

The program requires the following equipment: IBM PC/AT/XT, PS/2 or 100% compatible clone, 640KB of memory (RAM), a Hard Drive (at least 20 Megabytes), a Color monitor (CGA, EGA or VGA), a Printer, a Parallel port (can be same as the printer), and a Game port (required only for computerized assessment).

Cost

System Manager (required for all modules)	$ 295
Computerized Assessment Module (COMPASS)	3,595
DOT Database Module	995
DOT Job Descriptions	595
GOE Interest Survey Module	495
Work History Module	395
Career Planner Module	995
Local Database	495
PET Survey	495
TECO Test Conversion	595
Work Sample Scorer	895

A discount is available when the complete set of modules is purchased. In addition, VALPAR now offers a Software Update Service for $195 per year allowing users to remain current with software enhancements.

WorkNet
Labor Market Research & Job Development Database Manager

(Version 1091)

Precis

WorkNet, a service of American College Testing (ACT), is a flexible software program designed to organize information relating to employers and jobs. Programmed in Paradox, a relational database program, WorkNet has the capacity to store up to two billion employers and two billion jobs. The system permits division of jobs and industries by geographic regions. There is a provided list of industries taken mainly from the Standard Industrial Classification (SIC) system and a list of job titles. However, the WorkNet system program is empty when purchased. The user contacts specific employers in a given local region, then records data about the employer and the jobs in the employer's business. This local information about the employer and jobs are systematically organized and stored in WorkNet databanks. Once the information is collected and stored, it is readily available when one wants to find possible jobs for a client in a local company. An open system, WorkNet also allows one to add other job related (IBM compatible) databased programs. Thus, WorkNet has, as its primary purpose, the organization, storage, and rapid retrieval of information the user gathers, purchases, or obtains otherwise about jobs and employers. Copyrighted in 1988, 1990, and 1991 this Labor Market Research and Job Development Database Management System of WorkNet was developed by Marilyn Maze and is a service of American College Testing (ACT). Additional information is available from American College Testing, P.O. Box 168, Iowa City, IA 52243. Phone: (319) 337-1000; FAX: (319) 339-3021. Cost of the manual and software program is $1,495.

Development

WorkNet is a menu driven system programmed on the Paradox, relational databased program. Paradox automatically keeps track of the relationships between the WorkNet files and makes provisions for standard editing. If used fully and correctly and updated frequently, the system should prove immeasurably helpful in job development and job placement. For instance, in working with a client who has been deemed job ready and qualified for a position as a nurse's aide, one would first select the WorkNet region in which the client wants to work. Then, WorkNet can be used to quickly locate employers within the region who employ nurse's aides. The file reveals all pertinent data about these employers including a key contact person. Another feature of WorkNet is its capacity to record actual job openings. So, in short order the job ready nurse's aide can be given a list of local health service establishments which currently have openings for nurse's aides.

WorkNet is organized in an inverted triangle fashion; beginning with the general and descending to specific jobs in a designated geographic area. At the top of the inverted triangle one finds a provided list of industries, a supplemented adaptation of the Standard Industrial Classification (SIC) System. Next is a list of occupational titles (jobs). Descending to the more specific, the user then contacts local employers to gain pertinent data about their industry (business) and the jobs within that industry and enters this information into WorkNet (this can be done simultaneously during an employer telephone survey). Thus, the system results in a customized list of local employers and jobs within the employer's business. These can be grouped into as many as 20 geographic regions covering a city, county, or larger geographic area of the user's choice.

The developers of WorkNet obviously have been practitioners for the examples found in the manual reflect realistic experiences in job development and placement. Since WorkNet is basically a storage and retrieval system designed to organize information about employers and jobs, the user must be committed to do the research necessary to obtain, store, and constantly update information. The WorkNet manual stresses this fact and provides system assistance for editing and updating. The capacity to accept and store other IBM compatible job data banks is another admirable feature.

Since the capacity of WorkNet is so large, it might well be used by large agencies such as state vocational rehabilitation, statewide networks of rehabilitation facilities such as Goodwill or Easter Seal, and large private rehabilitation companies. Such use would probably require one or more full time researchers to develop and maintain the employer/jobs data information. The key to effective use of WorkNet would be the accurate collection and constant updating of the local information fed into the program.

Comprehensiveness and Use

As stated earlier, the purpose of WorkNet is to facilitate the collection and storage of labor market and job placement information. Given its huge capacity the possibilities of WorkNet in the job development and job placement area are endless. The open system permitting the addition of other compatible databases further extends its possibilities. Yet, the developers make no claim for its use in determining an individual's vocational direction, job readiness, or other vocational related assessment functions. But those willing to do the research necessary to catalog local employers, jobs, and job openings should be richly rewarded in job development and job placement efforts.

Utility

For those whose professional duties include job development and placement, WorkNet has the potential to be an especially helpful tool. A fully functioning and updated WorkNet file could also be useful to vocational consultants and experts, vocational evaluators wanting to make more relevant job recommendations, insurance claim managers, occupational analysts, Employment Service personnel, vocational educators, labor union personnel, and anyone else who has a need to know about local employers and jobs. WorkNet appears to be a fast and efficient means to access information about job possibilities for those seeking employment.

User Friendliness

The WorkNet manual states that experience with computers is not necessary to learn how to use WorkNet quickly. This may be a bit of an overstatement but the system does appear to be user friendly. Each screen always has a menu across the top. These are divided into two types. One menu features a list of words that can be quickly accessed. The second menu lists the various functions of the <F1>-<F10> function keys specifically programmed for WorkNet. For instance, hitting and entering the <F1> function key always provides help for the screen one is working on. The WorkNet manual provides clear, detailed information and illustrations for everything from installing the program on a hard disk drive and turning on the program to editing the various WorkNet files. The program also features a trial program (TRIALNET) to help the user to become more familiar with its use before beginning to use the actual WorkNet program. A maintenance disk is another admirable feature. An 800 number is provided to access ready technical assistance.

Documentation

The 57 page WorkNet manual has a five section Table of Contents which provides a general guide to areas of interest: Overview; Before you Start; Installing and Using WorkNet; Function Definitions; and Systems Administration. A more detailed table of contents would perhaps facilitate finding more specific items of interest. There is no index. However, the manual is well written and provides sufficient detail to operate the system and there is a helpful Glossary of Terms used in the manual. The manual also features in its appendices a listing of industries taken from the SIC code titles and supplemented by developer added titles. Similarly, the manual lists occupations and the WorkNet conversion of those occupations to WorkNet titles.

Hardware Requirements

An IBM AT, PS/2 or IBM compatible personal computer with a hard disk drive is necessary for WorkNet. A minimum of 640K RAM of memory is required. When shipped, the system requires only 3 megabytes of disk but the space needs rapidly expand as user generated data are entered. The minimum database recommended is 20 megabytes hard disk or hard card, but more space would be required if the system is to work at full capacity. WorkNet will accommodate about 1900 job records per megabyte of storage. The space needs reported here were provided by the developer in a new technical specifications bulletin. These needed space requirements are somewhat larger than that reported in the current (1991) manual.

One double sided 5-1/4" or 3.5" floppy disk drive, DOS of 3.0 or higher, and a printer would also be needed. The developers explain that some hard disk drives may require the disconnection of memory resident programs (e.g., pop-up computers, calendars, address files, clocks) to make space available for all WorkNet functions.

Cost

The cost for one installation of WorkNet is $1,495 (May, 1993). A second and third additional installation within an organization can be obtained for $1,275 each. For each added site beyond the first three, the unit cost drops to $1,125. This cost includes the program manual and developer provided software.

Additional cost factors would be the necessary hardware. Needed are: an IBM compatible personal computer with a hard disk drive featuring sufficient storage space to fully accommodate WorkNet; a disk drive for floppy disks; and a compatible printer. Manpower to conduct the needed surveys of employers and keep such information current would be another considerable cost factor.

III

User Survey Results

User Satisfaction Survey: Systems and Software

Introduction

The primary purpose of this section is to provide the reader with information from which an appraisal of vocational evaluation instruments and job search software can be made. In the preceding sections, reviews of systems and software were presented. This section is included to provide data that reflect levels of satisfaction of the users of these tools. Vocational evaluation professionals now rely upon data from several sources when formulating their appraisal of assessment tools. Refereed journals, publications such as previous comparisons of vocational evaluation systems by Botterbusch (1986), information from the manufacturers, hands-on experience with the product, and the informal data obtained through communication with colleagues are common evaluative sources used by practitioners. Conference proceedings commonly include topics addressing selection and use of vocational evaluation tools. A list of twenty questions that might be posed to developers to insure the buyer of an informed decision is contained in "Section IV: Assessing Systems and Software" of this document. This list was presented at the Sixth National Forum on Issues in Vocational Assessment conference, subsequently published in the paper "Selecting Vocational Evaluation Tools" (McDaniel & McClanahan, 1993), and contained in the proceedings The Issues Papers (Fry & Garner, 1993). The substance of these questions provided the stimulus for many of the survey items that are discussed in this section.

Before undertaking the task of surveying levels of user satisfaction, several preliminary questions must be considered. The initial question is whether or not there exists among users a measurable level of satisfaction. Even in the absence of objective data to support an affirmative response to this question, the *a priori* assumption must be affirmative in order to proceed. Given this critical assumption, the focus of the inquiry becomes the identification and means for assessing the various levels of user satisfaction with test batteries and software. Accepting the hypotheses that there exists a measurable level of user satisfaction, and that the level of satisfaction may vary by product, then further inquiry as to the specific factors which tend to influence a user's satisfaction with a product warrant investigation.

Instrument Development

Consumer satisfaction with any product is typically attributable to factors within three broad domains. These include (a) the product itself, (b) the user, and (c) the setting or environment in which the product is purchased and subsequently used. Accordingly, a survey designed to measure satisfaction with these products would include items addressing these three domains.

Two of these three domains, namely, the characteristics of the user and the environmental considerations, are common to both instruments and software. The makeup of the users and environmental considerations may vary according to group classification (users of software or systems), but the questions necessary to make that determination are constant across groups. Therefore, both the software and systems surveys contain virtually identical items related to these two elements.

The third domain, satisfaction with the product itself, was considered germane to software and to systems, and the survey items were developed independently. The basis for early item development was McFarlane's Consumer's Guide to Evaluate Work Samples and Work Sample Systems (1988). Items from the guide were presented for feedback to participants of continuing education training programs conducted by Auburn University. Once the content domains for the two instruments were identified, a 5-point Likert-type scale with the addition of a "not applicable" option was adopted. The scale and the coding values are shown below:

Very Satisfied	5
Somewhat Satisfied	4
Undecided	3
Somewhat Dissatisfied	2
Very Dissatisfied	1
N/A (Not Applicable)	0

In addition, the recommendation was followed that the survey should invite user comments. The survey draft was then revised and subsequently field-tested with a group of 30 vocational evaluators who were attending a five day vocational evaluation training program. The field test led to several improvements, and the revised drafts were then sent for comment to the manufacturers participating in the study. Of the 31 developers contacted, nine responded with input as to how the instruments might be refined. Final revisions were made which led to the finished instrument used in this study. Descriptions of the content domains for each of the two surveys follow.

Vocational Evaluation Systems Survey

The Vocational Evaluation Systems Survey instrument consists of three broad domains which include (a) Developmental Constructs, (b) Specifications, and (c) Worker Trait Factors. These three broad categories are then subdivided into 77 variables. A brief description of the broad categories and the related factors follow:

Developmental Constructs. Developmental Constructs included data that are usually found in the system's manual. These constructs included reliability, validity, norms, criterion reference (the relationship of the instrument to The Dictionary of Occupational Titles, and/or other authoritative resources), and statistics. Statistics include the analysis of the instrument data, the statistical techniques used, and the relationship of the techniques to the purpose of the instrument.

Specifications. Specifications included the product description, cost, durability, warranty, training availability and requirements, personnel required to administer the system, test administration guidelines, the manner in which the system can be modified to accommodate various disability groups or persons with varying functional limitations, and the length of time and method employed to score the tests. This information is usually found in the system's manual, accompanying price lists, correspondence from the manufacturer, the evaluator's experience with the system, and a consistency between the manufacturer's claims and the evaluator's experience.

Worker Trait Factors. All of the vocational evaluation systems reviewed included the means by which to evaluate at least some of the worker trait factors contained in the Department of Labor's occupational databases. These worker trait factors were included as survey items. Definitions of each of these traits, which were paraphrased in the survey instrument, can be found in The Revised Handbook for Analyzing Jobs (JIST, 1991). Variables include (a) 20 Physical Demands, (b) 14 Environmental Conditions, (c) nine levels of Specific Vocational

Preparation (SVP), (d) three categories of General Educational Development (e.g., Reasoning, Math, Language), (e) 11 categories of Vocational Aptitudes, (f) Interests, and (g)Temperaments.

Vocational Job Search Software Survey

Identification of the content domains for the appraisal of user satisfaction of vocational software was not easily accomplished. This is attributable, at least to some degree, to the lack of references contained within the professional body of literature. Clearly, the utilization of computers is an asset to the practice and is now commonplace in many vocational evaluation settings. This infiltration, however, has been a phenomenon observable only during the past decade, and the proliferation of the desktop is not yet complete. Once again, McFarlane's guide provided items to begin the process of survey content development, which was then followed by the solicitation of input from software users, and subsequent review by the developers. The vocational software content domains are described in five broad categories, namely, (a) Comprehensiveness, (b) Utility, (c) User Friendliness and Support, (d) Documentation, and (e) Cost. These five categories are then subdivided into 31 content domains. A brief description of each category follows:

Comprehensiveness. The comprehensiveness of the program is best described as a function of its eight content domains that include the Database, Transferable Skills, Aptitude Match, Occupational Information, Educational Information, Ability to Customize Report, Ability to Crosswalk between Codes, and Use with Other Evaluation Tools. The source of this information is the manual and the users' experience with the software.

Utility. Utility refers to the range and scope of the usefulness of the software to the practitioner. Subcategories of Utility include Vocational Evaluation, Expert Testimony, Job Placement, Career Counseling, Labor Market Information, and other uses.

User Friendliness and Support. User Friendliness and Support were subdivided into nine content domains including: Ease of Installation, Intuitiveness (functions as the user would expect or anticipate the software to function), Method and Ease of Data Input (whether or not the program is menu-driven, how helpful the on-screen directions are, etc.), Ease of Printing and Storing, Screen Clarity, Usefulness of Help Screens, Processing Speed, the Overall Attractiveness of the program (both in terms of aesthetic and fun-appeal), and the Ongoing Support provided by the manufacturer.

Documentation. The Documentation refers to the paperwork and manuals accompanying the system which are used for purposes of instruction and use with the software. It also includes the source of references and/or justification of the data contained in the program. Documentation includes four variables: Accuracy, Comprehensiveness, Readability, and Usefulness as a Reference.

Cost. The cost of the system included the initial purchase price and any on-going expenses. On-going expenses include (a) regular program adjustments/updates, (b) on-line support for technical assistance, (c) the existence, inclusion, and duration of a warranty, and (d) other costs associated with keeping the software under warranty.

User Characteristics

User characteristics included demographics, education, training and experience, and the work setting in which the respondent practices. Education and training included highest achieved level of education, whether or not the degree achieved was in rehabilitation or directly related, and the presence of certifications (e.g., CVE, CRC, LPC, LRC, etc.). Options for work setting included the state vocational rehabilitation agency, state agency other than vocational rehabilitation, private non-profit agency, private for-profit agency, and/or self-employment. Experience was defined as the period of time in which the respondent was a practicing vocational evaluator.

Environmental Considerations

There are three types of environmental considerations relevant to this study. These include (a) the process by which the product was acquired, (b) whether or not the individual received training by the product manufacturer, and (c) the length of time in possession of the product. These variables were viewed as reasonable to include for numerous reasons. The means by which the product was acquired could have some impact on the level of satisfaction of the user. Persons tend to have greater ownership of the consequences of their own decisions than those decisions made by others. A variable which addresses whether the user attended training sponsored by the product manufacturer was included to consider the impact of that training on satisfaction. It seems plausible that persons who have greater facility with a product would have a higher level of satisfaction than those individuals who are not as skilled with the product. Finally, the length of time with a product and the user's familiarity with it are variables which could influence the level of satisfaction.

Subjects

The Vocational Evaluation and Work Adjustment Association's (VEWAA) national mailing list was used to identify the total population for consideration in this study. An introductory letter was sent to each VEWAA member on the mailing list requesting that the member respond if interested in participating in a study reviewing vocational evaluation systems and related job-search software. Of the initial group contacted (N=1,594), 551 responses were returned indicating willingness to participate in the study. Surveys and two follow-up reminders were mailed, and 298 usable surveys were returned for a response rate of the sample of 54%.

Demographic Makeup of Respondents. The subjects for this study represented a well-educated and experienced group of professionals. Sixty-nine percent of the respondents reported a master's degree as their highest achieved educational level, and the average experience as a practicing vocational evaluator was 9.6 years. Seventy-eight percent indicated that their highest achieved degree was in rehabilitation or a directly related discipline.

The majority of those responding to the survey were credentialed by at least one national organization, and some had multiple certifications. Fifty-seven percent of the sample members were Certified Vocational Evaluators, 29% Certified Rehabilitation Counselors, and 15% were otherwise certified (i.e., LPC, LRC, CIRS).

Forty-five percent of the respondents were male, 51% female, and the average age was 40 years. Twelve percent of those responding were employed in vocational rehabilitation settings, while 34% were employed in private, non-profit facilities. Thirteen percent were employed by private for-profit organizations, 7% were self-employed, and 10% defined their setting otherwise.

Seventy-four percent of the respondents were full-time employees, 13% self-employed full-time, while the remaining respondents were either unemployed (1%), self-employed part-time, or employed by someone else part-time. Ninety-two percent of the subjects identified their ethnic background as white, 5% black, and the remainder was divided among Asian, Hispanic, and Other. A compilation of the respondents' characteristics are summarized in Table 1.

Table 1
Characteristics of Respondents*

	Overall Sample (n=298)		Systems (n=206)		Software (n=92)	
Gender						
Female	153	(51%)	109	(53%)	46	(50%)
Male	132	(45%)	86	(42%)	44	(48%)
Missing data	13	(4%)	11	(5%)	2	(2%)
Educational Level						
High School/Less	2	(1%)	2	(1%)	1	(1%)
Bachelors	53	(18%)	43	(21%)	10	(11%)
Masters	206	(69%)	135	(66%)	71	(77%)
Doctorate	25	(8%)	16	(8%)	9	(10%)
Missing data	12	(4%)	10	(4%)	1	(1%)
Highest Degree in Rehabilitation						
Yes	231	(78%)	155	(75%)	76	(83%)
No	55	(18%)	41	(20%)	14	(15%)
Missing	12	(4%)	10	(5%)	2	(2%)
Certified Vocational Evaluator						
Yes	169	(57%)	111	(54%)	58	(63%)
No	117	(39%)	85	(41%)	32	(35%)
Missing	12	(4%)	10	(5%)	2	(2%)
Certified Rehabilitation Counselor						
Yes	87	(29%)	46	(22%)	42	(46%)
No	197	(66%)	150	(73%)	47	(51%)
Missing	14	(5%)	10	(5%)	3	(3%)
Other Certification						
Yes	45	(15%)	26	(12%)	20	(22%)
No	236	(79%)	178	(83%)	66	(72%)
Missing	17	(6%)	2	(2%)	6	(6%)
Employment Setting						
Vocational Rehabilitation	37	(12%)	26	(13%)	11	(12%)
State Agency Other than VR	59	(20%)	49	(24%)	10	(11%)
Private/NonProfit	102	(34%)	80	(39%)	22	(24%)
Private Profit	38	(13%)	16	(8%)	22	(24%)
Self-Employed	14	(7%)	17	(19%)		
Other	31	(10%)	10	(5%)	7	(8%)
Missing	31	(10%)	10	(5%)	3	(3%)
Age (in Years)						
Average		40		39.2		40
Range		25-64		25-64		26-59
Experience as Vocational Evaluator (in Years)						
Average		9.6		9.0		11
Range		>1 - 36		0-29		1-36

* NOTE: Percentages may not total 100% due to rounding error.

Results

User responses to the survey provided input regarding 50 vocational evaluation systems and software packages. The frequency of responses for each product were highly variable, ranging from an *n* of 1 to an *n* of 51, with only 7 of the vocational evaluation systems and 6 of the software programs having an *n* of 8 or more. Therefore, the only products which will be specifically addressed are those in which the response rate was 8 or more. All of the responses, however, were utilized to calculate the overall group statistical values. A summary of the results of the vocational evaluation systems survey responses will be presented, followed by a summary of the survey responses of the software users.

Relationship of Satisfaction to Demographic Variables - Systems and Software

A Chi-square analysis was utilized to explore the relationship between five user and environmental demographic variables. These variables included whether the respondent (a) was the purchaser of the tool, (b) achieved their highest academic degree in rehabilitation, (c) was a Certified Vocational Evaluator, (d) was a Certified Rehabilitation Counselor, or (e) was a Licensed Professional Counselor, or otherwise licensed. Pearson's Chi-square analysis revealed a significant association between the user's satisfaction rating and whether the respondent was the purchaser of the tool ($\chi^2=31.2734$, $p=.001$).

A correlational procedure (Pearson's) was conducted to explore the relationship between user satisfaction and the variables which failed the chi-square tests of significance. In addition, years of respondent experience in the field of vocational evaluation was included in the procedure. Table 2 summarizes the results. There is a significant relationship ($p<.05$) between the user's satisfaction rating and (a) whether the respondents achieved their highest degree in rehabilitation and (b) length of respondent experience in the field of vocational evaluation.

Table 2
Correlations Between Overall Rating of Satisfaction and User and Environmental Demographic Variables (N=298)

	Pearson Value (r)	Probability
Highest Degree in Rehabilitation	.1060	.039*
Certified Vocational Evaluator	.0701	.123
Certified Rehabilitation Counselor	.0343	.285
Licensed Professional Counselor/Other	.0451	.228
Years of Experience	.1164	.027*

*Significant ($p<.05$)

Results of Vocational Evaluation Systems Survey

Data analysis of the vocational evaluation systems was based on the return of two-hundred and six (206) usable surveys. Of these, seven systems had response rates of 8 or more. These systems and the number of responses are as follows:

Name of System	N
APTICOM	28
McCARRON-DIAL	35
SAGE	15
VALPAR	51
MESA/SYSTEM 2000	15
VIEWS	10
VITAS	13

Each of the vocational evaluation systems surveys gave the opportunity for the respondents to provide data on 98 variables plus qualitative comments. In order to provide salient analyses, similar variables were concatenated and a reliability analysis was conducted on each new scale. A coefficient alpha (α) was calculated. Coefficient alpha (α) is an estimate of the internal consistency of the individual items; the higher the alpha, the greater the internal consistency. The new categories and the respective alpha reliability coefficients are shown in Table 3.

Table 3
Coefficient Alpha Values for Vocational Evaluation Systems Constructs

Variable	Coefficient Alpha (α)
Developmental Construct	.73
Specifications	.75
Physical Demands	.93
Environmental Conditions	.96
Specific Vocational Preparation (SVP)	.96
General Education Development (GED)	.89
Aptitudes	.80

Interests and Temperaments consisted of one variable each in the survey so no reliability studies were necessary.

The respondents' satisfaction rating of these nine system constructs is presented in Figure 1. The greatest degree of reported satisfaction was with the Developmental Constructs of the system, followed closely by satisfaction with the systems' Aptitude assessment. The systems' Specifications were rated at about the same degree of satisfaction as the Interests assessment construct, which is followed by the Temperaments assessment. Satisfaction with the systems' General Educational Development evaluation was in the relative mid-range. Not surprisingly, the lower levels of satisfaction were obtained with respect to the users' satisfaction with the systems' method of measuring Environmental Factors, Physical Capacities, and the Specific Vocational Preparation.

Overall Satisfaction - Systems

To compare the seven systems, means were taken from the responses of the participants to an item on the survey that asked them to rate their overall satisfaction with each system. The range of means is from 3.8 to 4.4, with the average rating for all systems being 4.1, or in the

Somewhat Satisfied range (see Figure 2). There is a general sense of satisfaction with every one of the instruments, with the lowermost score on the upper end of the Undecided range and the upper end score in the mid-range of the Somewhat Satisfied rating.

Figure 1
Satisfaction with System Constructs Overall

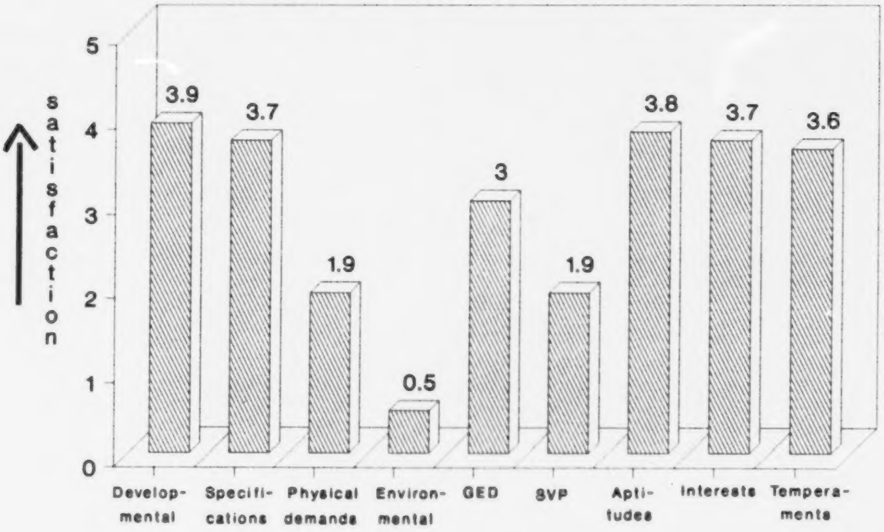
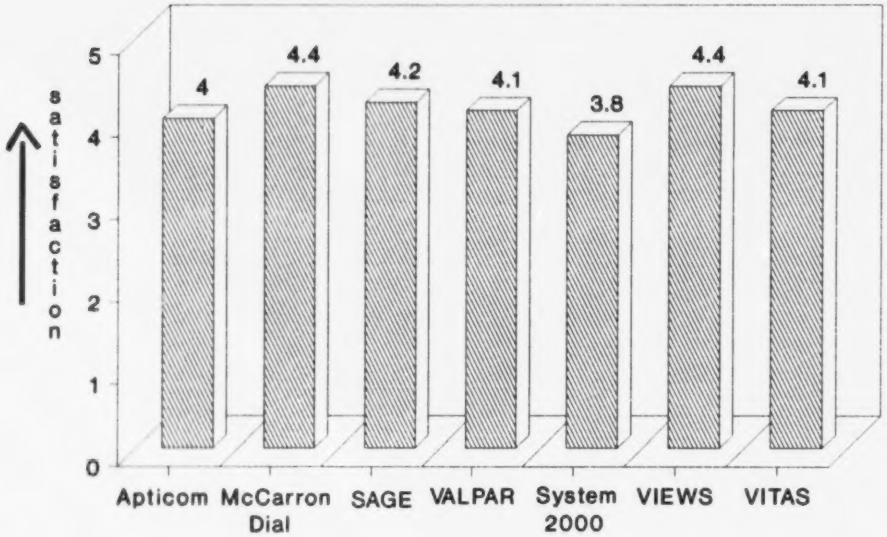
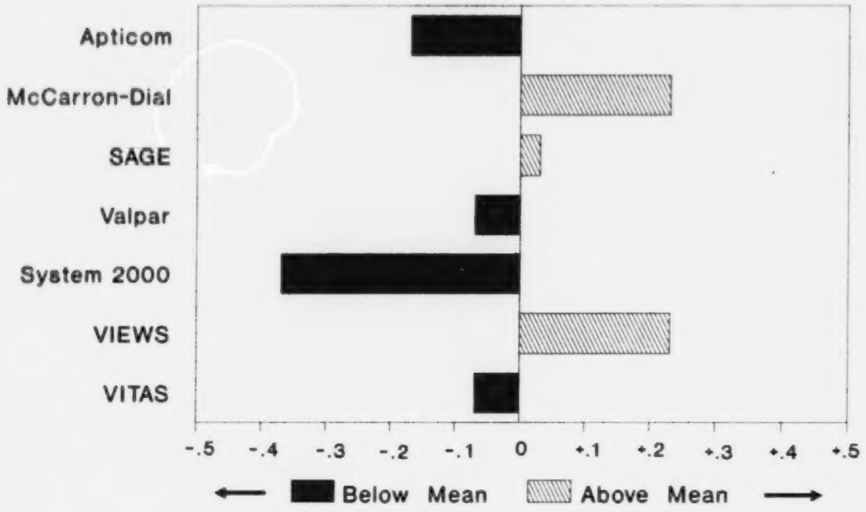


Figure 2
Comparisons of Systems Satisfaction Overall



The means of the satisfaction ratings across all systems are grouped in the Somewhat Satisfied range, and as presented above, reflect little disparity of the users' appraisals between the systems. In order to highlight the disparity between ratings of the various systems, the arithmetic mean for all systems, 4.1, was assigned the midpoint, and each interval was assigned a value of .1. Positive variations, or those above the mean, extend to the right, negative variations to the left. A graphical depiction of this procedure is shown in Figure 3.

Figure 3. Comparison of Satisfaction: Systems



Design and Analysis - Systems

A one-way ANOVA design was used in the present study. Follow-up Tukey comparisons were applied to the significant effects to determine the specific nature of the differences between the groups on the major constructs.

The five constructs of 1) Physical Demands, 2) Working or Environmental Conditions, 3) Specific Vocational Preparation, 4) Interests, and 5) Temperaments were not included in this analysis. Physical Demands, Environmental Conditions and Specific Vocational Preparation were omitted because none of the systems purported to measure these traits specifically, which is accurately reflected in the users' responses. Fifty percent of the responses were Not Applicable, and the mean values for those who responded otherwise rated these variables for all systems in the Somewhat Dissatisfied range. Interests and Temperaments were similarly omitted as only four of the systems (SAGE, System 2000/Mesa, VIEWS and VITAS) had response rates which justified reporting the scores. The one-way ANOVA was applied to each of the four remaining constructs.

The results from the one-way ANOVAs are displayed in Table 4. It was found that all six of these F-ratios were statistically significant ($p < .001$). These results indicate that the satisfaction was different among the seven evaluation systems reviewed in this study. An explanation of the differences follows Table 4.

Table 4
Analysis of Variance of Respondents' Ratings of Satisfaction with Components of Vocational Evaluation Systems

Source	DF	Sum of Squares	Mean Squares	F Ratio	F Probability
Developmental					
Between Groups	6	14.1315	2.3553	4.2643	.0005
Within Groups	158	87.2663	.5523		
Total	164	101.3978			
Specifications					
Between Groups	6	12.0310	2.0052	4.2057	.0006
Within Groups	151	71.9922	.4768		
Total	157	84.0232			
General Education Development					
Between Groups	6	113.6492	18.9415	9.5532	.0001
Within Groups	160	317.2397	1.9827		
Total	166	430.8889			
Aptitudes					
Between Groups	6	20.0650	3.3442	4.1131	.0007
Within Groups	159	129.2764	.8131		
Total	165	149.3414			

Developmental Constructs. A difference in satisfaction with the Developmental construct was found among the seven evaluation systems ($F_{6,158} = 4.246$, $p= .0005$). The results from the follow-up Tukey test helped to further explain these differences. Specifically, the McCarron-Dial System was rated with greater satisfaction than both the VITAS and VALPAR systems. The APTICOM system also received higher satisfaction ratings than the VITAS system.

Specifications. Satisfaction with the Specifications construct was found among the seven evaluation systems ($F_{6,151} = 4.206$, $p= .0006$). The results from the follow-up Tukey test indicated that the McCarron-Dial System was rated with greater satisfaction than the SAGE, VITAS and VALPAR systems.

General Educational Development (GED). Satisfaction with the General Educational Development construct was found to significantly differ among the seven evaluation systems ($F_{6,160} = 9.553$, $p= .0001$). SAGE and APTICOM, as indicated by the results of the follow-up Tukey test, were rated with greater satisfaction than the VIEWS, VITAS, VALPAR and McCarron-Dial systems. Satisfaction with this construct was statistically higher on MESA/System 2000 than VIEWS and VALPAR.

Aptitudes. A difference in satisfaction with the Aptitudes construct was found among the seven evaluation systems ($F_{6,159} = 4.113$, $p= .0007$). The follow-up Tukey test indicated that the

SAGE system was rated with greater satisfaction than the McCarron-Dial and MESA/System 2000, and the APTICOM was rated higher (statistically) than the McCarron-Dial.

In addition to the ANOVA results, Pearson's Chi-square analysis revealed a significant association between the user's rating of satisfaction with the instrument and whether or not the user was the one who actually purchased the system ($\chi^2=12.2397$, $p=.0157$).

Comparisons of Job Search Software Programs

The procedure for analyzing the users' satisfaction with the software systems was precisely the same as with the vocational evaluation instruments. To be considered for inclusion in the analysis, a minimum of eight responses was established. As was the procedure employed with the systems, the software program variables were concatenated for purposes of analysis. The software packages and their respective response rates being considered in this analysis are:

Name of Software	N
CAPCO	9
JOBS II	8
LMA PLUS/QUEST	12
MESA/SYSTEM 2000	8
OASYS	35
RAVE	8

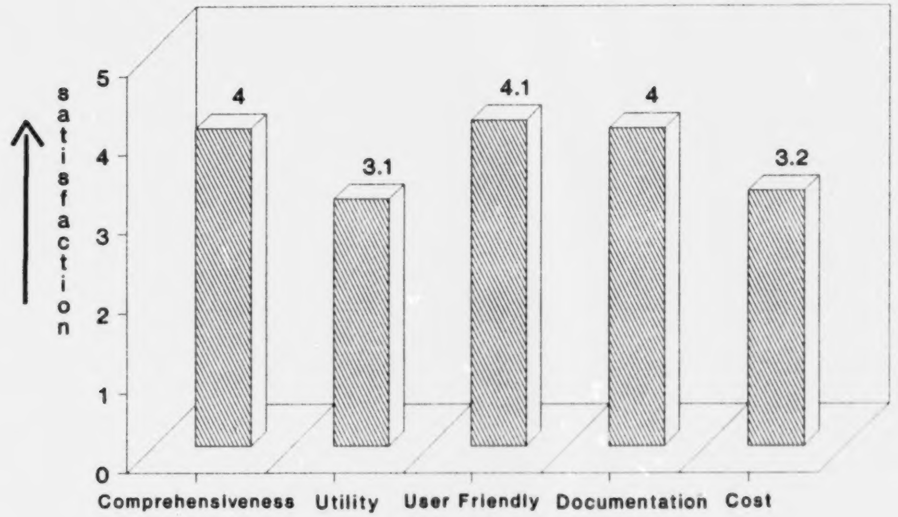
The software surveys provided the opportunity for subjects to respond to 54 variables; 30 of the variables were concatenated into five categories and alpha reliability coefficients (α) were calculated for each. The following (Table 5) are the categories and alpha reliability coefficients.

Table 5
Coefficient Alpha Values for
Job Search Software Constructs

Variable	Coefficient Alpha (α)
Comprehensiveness	.82
Utility	.61
User Friendliness/Support	.81
Documentation	.94
Cost	.90

Means were calculated for all software systems for the five categorical variables and revealed an average of Somewhat Satisfied for the categories of Comprehensiveness, User Friendliness, and Documentation, and almost a full point lower to the Undecided range in Utility and Cost. These values are reflected in Figure 4.

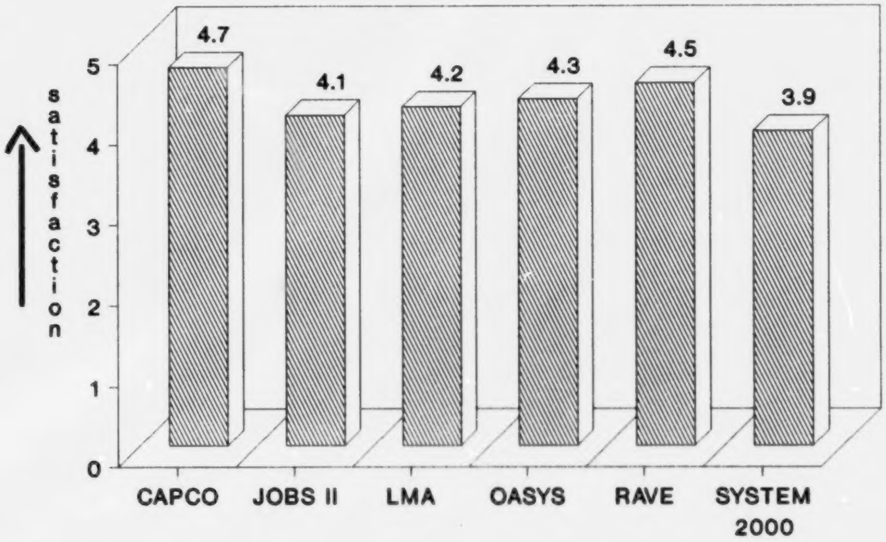
Figure 4
Satisfaction with Software Constructs Overall



Overall Satisfaction - Software

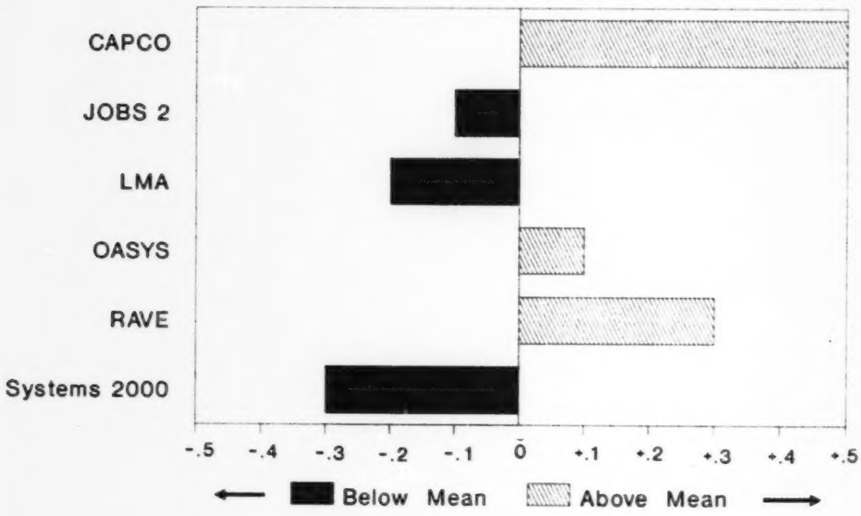
Means were calculated for the six systems to a survey item which asked respondents to rate their overall satisfaction with the software. The comparison of those averages are shown in Figure 5.

Figure 5
Comparisons of Software Satisfaction Overall



The range of the mean levels of satisfaction are just below the Somewhat Satisfied range (3.9) to almost Very Satisfied (4.7). Interestingly, the only system reviewed which uses mainframe access, the CAPCO System, was rated the highest. To examine the disparity between the software systems more closely, a procedure similar to that which was used with the evaluation systems analysis was employed. The arithmetic mean of all the software systems of 4.2 was assigned the mid-point and each interval represents a deviation from the mean of .1, in a positive direction to the right, and negative to the left. A graphical depiction of the outcome of this procedure is shown in Figure 6.

Figure 6
Comparison of Satisfaction: Software



Design and Analysis - Software

As in the case of the analysis of the responses to the systems surveys, a significant relationship was found between user satisfaction and who made the purchase. Respondents who purchased the software tended to be more satisfied with the software than those who did not ($\chi^2=21.37658$, $p= .0003$).

A one-way ANOVA design was used and follow-up Tukey comparisons were applied to the significant effects to determine the specific nature of the differences between the groups on the major constructs. The results from the one-way ANOVAs are displayed in Table 6. It was found that two of the F-ratios, those relating to the Comprehensiveness and Documentation constructs, were statistically significant ($p < .001$). These results indicate that the satisfaction with the constructs was different among the six job search software programs reviewed in this study. The differences will be examined in more detail following the table.

A difference in satisfaction with the Comprehensiveness construct was found among the six software programs ($F_{5,73} = 4.1512$, $p= .0023$). The results from the follow-up Tukey test indicate that the CAPCO and OASYS programs were rated with greater satisfaction than the Labor Market Access Program.

Table 6
Analysis of Variance of Respondents' Ratings of Satisfaction with Components of Job-Related Software

Source	DF	Sum of Squares	Mean Squares	F Ratio	F Probability
Comprehensiveness					
Between Groups	5	13.4511	2.6902	4.1512	.0023
Within Groups	73	47.3084	.6481		
Total	78	60.7595			
Utility					
Between Groups	3	10.1905	3.3968	3.9963	.0414
Within Groups	10	8.5000	.8500		
Total	13	18.6905			
User Friendliness and Support					
Between Groups	5	4.1361	.8272	1.4549	.2159
Within Groups	69	39.2311	.5686		
Total	74	43.3672			
Documentation					
Between Groups	5	20.0553	4.0111	3.3456	.0089
Within Groups	74	88.7189	1.1989		
Total	79	108.7742			
Cost					
Between Groups	5	9.6809	1.9362	.7808	.5668
Within Groups	71	176.0562	2.4710		
Total	76	185.7371			

Documentation. Satisfaction with the Documentation construct was found to significantly differ among the six software programs ($F_{5,74} = 3.3456$, $p= .00889$). OASYS, as indicated by the results of the follow-up Tukey test, was given statistically significant higher satisfaction ratings than the CAPCO program.

The one-way analysis of variance between satisfaction with the constructs of Utility of Instrument, User Friendliness and Support, and Cost failed to yield any statistically significant difference ($p>.05$).

In addition to the ANOVAs, a Chi-square analysis of the relationship between the rating of satisfaction with the software and selected demographic variables was performed. A significant relationship was found between user satisfaction and who made the purchase. Respondents who purchased the software tended to be more satisfied with the software than those who did not ($\chi^2=21.3766$, $p= .0003$).

Summary of Users' Comments and Ratings

The analysis of the ratings of vocational evaluation systems and job search software have thus far been reported in the 5-point Likert-type scale. The purpose of this section is to summarize this quantitative information for each product and to provide an analysis of the narrative comments received from the respondents.

The method employed to summarize the users' comments follows the traditionally accepted methods of qualitative data analysis. Miles and Huberman (1984) identify twelve techniques for generating meaning from narrative comments, five of which were employed in this segment of the study. The techniques include (a) counting, (b) noting patterns and themes, (c) seeing plausibility, (d) clustering, and (e) noting relations between variables. This process is consistent with Patton's methodological approach to meta-evaluation, which is an evaluation of an evaluation (Patton, 1990).

There were comments made related to the systems and the software packages which applied to virtually all of the products reviewed. In the case of the systems, the comments frequently were that the systems were too expensive, expendables either expensive and/or cumbersome, the norm groups were not always acceptable, and there was a lack of specific instructions for administration to many, if not all, of the groups of persons of varying disabilities. Since these types of comments were so pervasive, they are referenced here as issues, both specific to the products, and more importantly, germane to the industry. Likewise, the software packages had similar themes. More comments were raised about the expense of the software packages, usually referring to the initial and the on-going costs. Several of the products reviewed have "on-line costs" and some of the updates and upgrades were only provided at a cost to the user. One comment which seemed to reflect issues in the public domain was that budgets were developed on an annual basis, and updates frequently were not figured into the cost of the software package and could, therefore, not be purchased. Also frequently referenced as a weakness of the software packages related to the databases being accessed. The software packages reviewed are directly or indirectly tied into the Department of Labor databases, and results obtained from these databases must be carefully scrutinized as the application to each individual situation is limited. Users must be cognizant, for example, that reviews of many of the jobs listed in The Dictionary of Occupational Titles database are dated (some analyses were conducted in 1977), do not necessarily reflect the specifics of local jobs, and the profiles of the jobs represent an averaging process.

The following section details a summary of quantitative ratings and qualitative comments for each product. The ratings, presented as histograms, represent the means of the ratings for each of the constructs, followed by a summary of user comments. The comments are categorized by (a) strengths, (b) weaknesses, and (c) recommendations for change.

SUMMARY OF SURVEY RESPONSES - SYSTEMS

APTICOM

User Ratings and Comments

Strengths

The operative word found in the users' assessment of strengths of the APTICOM is "quick." Respondents regularly indicated that the APTICOM was a quick instrument to administer (1 1/2 hours) and the prevailing sense was that good information was obtained in a short time. Users commented that it was not only quickly administered but generated its own report with the push of a button. There were also numerous comments referencing satisfaction with the APTICOM's relationship to The Dictionary of Occupational Titles factors, the General Aptitude Test Battery, and the OAP structure.

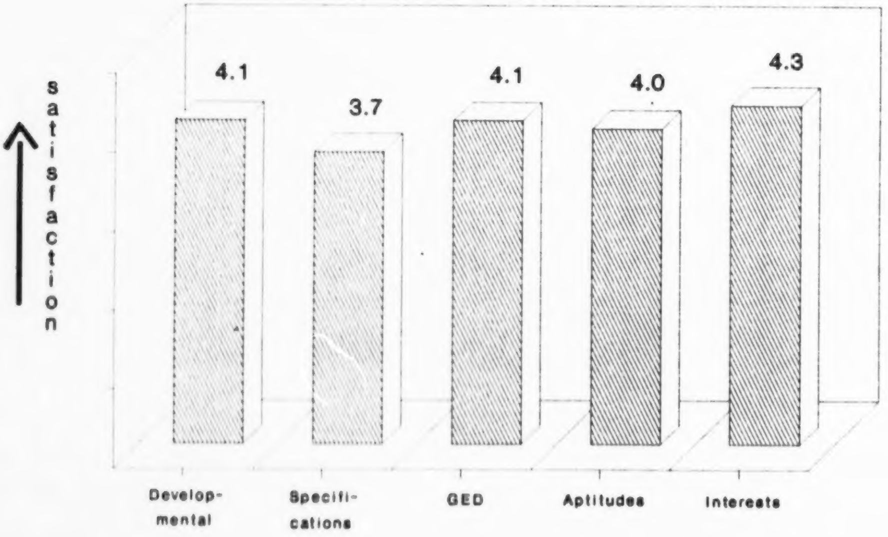
Weaknesses

The general comments related to assessing the weaknesses of the APTICOM were oriented to cost, lack of flexibility with the system, (particularly the report-writer function), lack of administration flexibility for disability-specific accommodation, and a few comments which identified persons with having upper extremity limitations being difficult to access on the APTICOM. The reading level requirement, which was referenced as being 4th grade by the users, was viewed by several of the respondents as being a limitation of the system.

Recommended Changes

The most frequently identified change the users suggested was that the APTICOM should have the capability for modification for persons with varying disabilities. Comments were also made that the test does not provide the higher-level functioning jobs, and the recommendation was made that APTICOM address all of the jobs listed in The Dictionary of Occupational Titles. Some of the users emphasized in their comments that the APTICOM is most appropriately used as a screening instrument but expressed a need for additional testing for confirmation of vocational capabilities.

Figure 7
Satisfaction with System Constructs: APTICOM



McCARRON-DIAL

User Ratings and Comments

Strengths

The use of this system with persons classified as having cognitive impairments was the most frequent strength referenced. The applicability of the McCarron-Dial to persons with mental retardation, specific learning disabilities, traumatic brain injury, and neurologic impairment was identified as appropriate. Portability was viewed as a strength, as was the consideration of the McCarron-Dial to emotional factors of the evaluee. The flexibility of the system to administer, in whole or part, was also viewed as a strength.

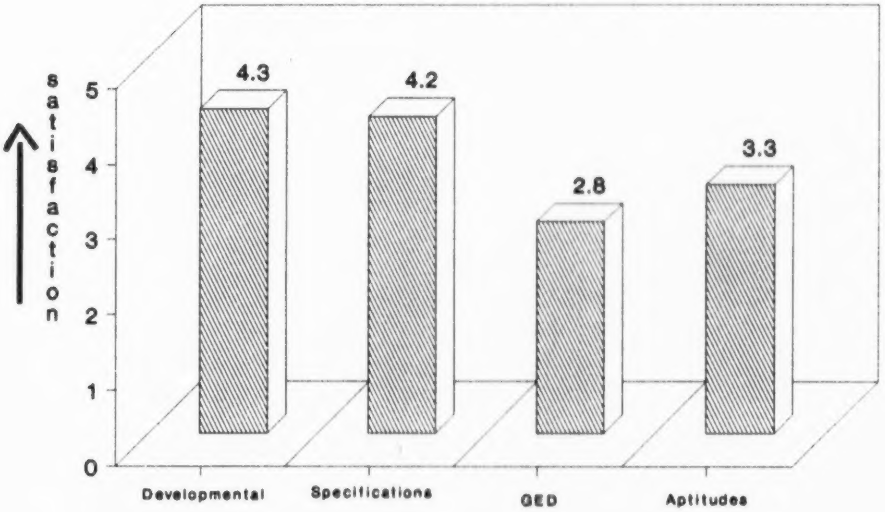
Weaknesses

The one most common weakness referenced by the respondents is that the McCarron-Dial must be used in a one-on-one setting, making it labor-intensive. Also referenced was the lack of relationship to the worker trait factors in The Dictionary of Occupational Titles. Respondents viewed as a limitation the system's inapplicability to mildly disabled individuals, which included industrially injured clients.

Recommended Changes

Interests and physical capacities assessment instruments were frequently referenced as additions which would add value to the use of the system. More frequent updates was also a common recommendation.

Figure 8
Satisfaction with System Constructs: McCarron-Dial



SAGE

User Ratings and Comments

Strengths

Most comments related to the ease of administration, particularly with groups. The flexibility of the system, which includes the option for using it either as a complete battery or selecting component parts, was also viewed positively by the respondents. There were several comments made that also indicated an appreciation that the system's administration could be varied to accommodate specific disabilities. Several comments were made that the administration manual accompanying the SAGE was highly beneficial to them.

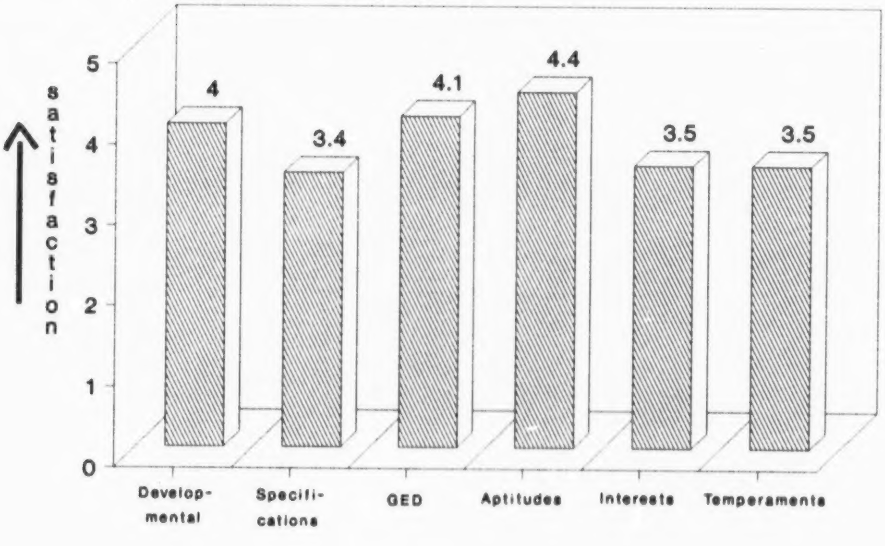
Weaknesses

The weaknesses referenced by the respondents were highly variable and no real themes were discernible. The only comments that seemed to occur more than one time was that the system was initially expensive and somewhat bulky for transportation.

Recommended Changes

The changes recommended were not uniform; the only consistency was related to identifying ways to keep down the initial and ongoing costs.

Figure 9
Satisfaction with System Constructs: SAGE



SYSTEM 2000/MESA (System)
User Ratings and Comments

Strengths

Ease of use and quickness were the common strengths referenced by the respondents. Comments also indicated that the system was successfully designed to maintain the interest of the evaluee. The system being specifically referenced to the Dictionary of Occupational Titles was listed as a strength.

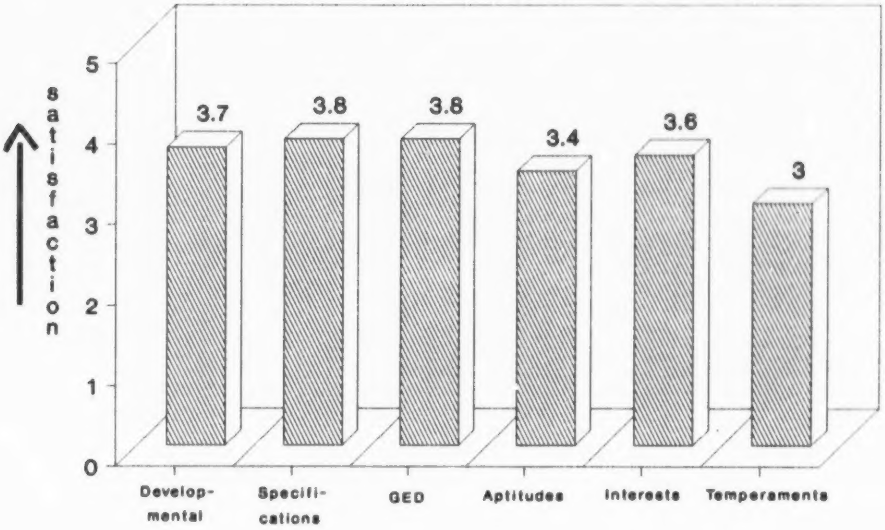
Weaknesses

The system was considered to be appropriate only for the mid-range functioning client and not useful with individuals with the upper or lowermost functional capabilities. Reliability was referenced as a weakness, as was inability to accommodate different types and severity of disability.

Recommended Changes

Adapting the system in a way which would allow flexible administration of the instrument to accommodate persons with severe disabilities was a common theme. Several comments were made that the system's weaknesses had been remedied by the updated System 2000.

Figure 10
Satisfaction with System Constructs: System 2000



VALPAR

User Ratings and Comments

Strengths

Face validity, or the obvious relationship of the work samples to actual jobs, and the MTM (Methods-Time-Measurement) norms were referenced as a strength. Flexibility with the administration of the work samples was valued, particularly when making disability-specific accommodation. Behavioral observations obtained through the administration were viewed as helpful. Manuals were referenced as easy to use and the work samples easy to score and interpret.

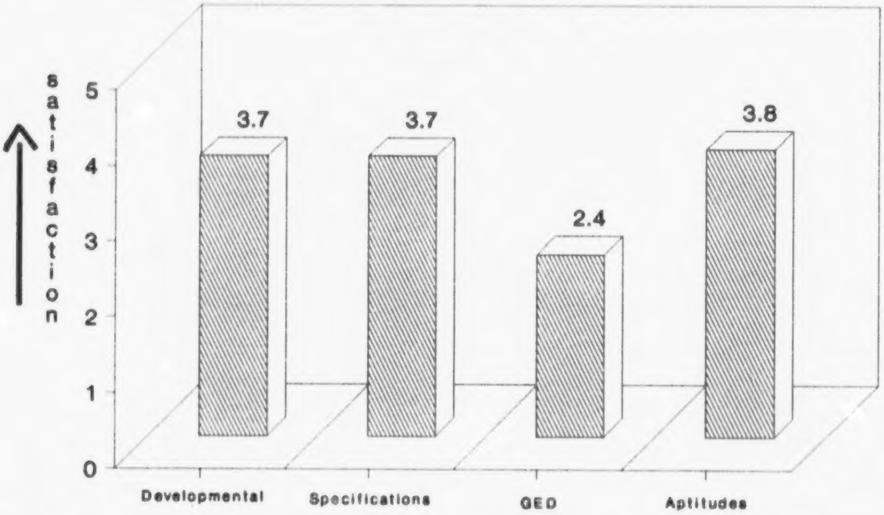
Weaknesses

Weaknesses referenced pertain to the norm groups being either inadequate or out-dated. Although the MTM standards are highly valued, the other normative data were lacking. The work samples were cited as adequate for use with the middle-range functioning client but questionable for the developmentally low functioning client and also for the highly functioning individual. There was also a weakness referenced of being unable to relate the results of the VALPAR testing specifically to the worker trait factors. The lack of portability was also viewed as a limitation.

Recommended Changes

Most of the comments recommending changes to the VALPAR were those which referred to reconciling the previously referenced weaknesses, particularly with respect to norm groups. The respondents seemed to value the system, wanted more updated norms, and expressed the opinion that some of the work samples were not reflective of today's job market and might need to be upgraded.

Figure 11
Satisfaction with System Constructs: VALPAR



VIEWS

User Ratings and Comments

Strengths

Administration, interpretation, and general use with individuals with developmental disabilities, particularly mentally retarded, were referenced as the common strengths of this system. Several of the respondents indicated that it is the "only thing" for use with persons who have been classified as being mentally retarded. The ease of administration, flexibility in administration, face validity, and portability were also referenced as strengths.

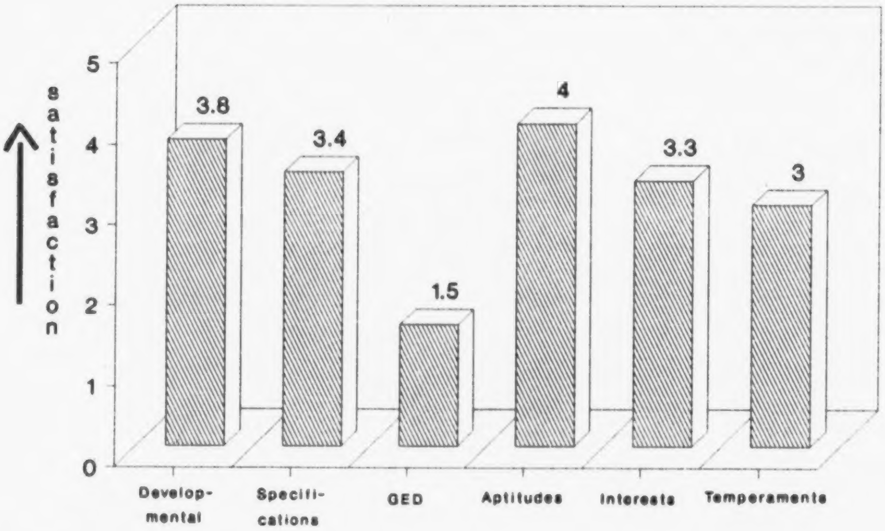
Weaknesses

Whereas the system has, as its strength, its easy use for persons with developmental disabilities, it was viewed as a weaknesses by several of the respondents because there were no norm groups for higher-functioning individuals or for any other groups whatsoever. There were also some comments which indicated that the VIEWS had applicability only to a limited sampling of jobs and did not provide an assessment of worker trait factors that could then be used in searching the Department of Labor databases for job matches.

Recommended Changes

There was a general sense of satisfaction with the VIEWS as expressed by the users. The themes for changes being recommended related to updating and perhaps identifying other normative populations so that those groups could similarly be used with the work sample system.

Figure 12
Satisfaction with System Constructs: VIEWS



VITAS

User Ratings and Comments

Strengths

Strengths of the VITAS include ease of administration and scoring and its utility with school-based populations. In addition, the respondents indicated that the VITAS was durable and involved few consumable supplies.

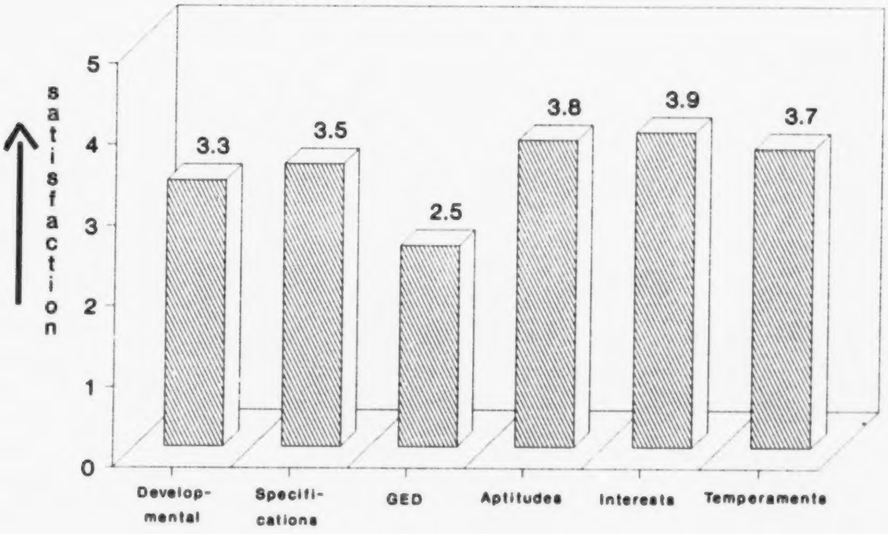
Weaknesses

The two areas of weakness identified include the normative group and the relationship to The Dictionary of Occupational Titles database. Several comments were directed to updating the norms to reflect adult populations. The actual samplings of work were considered to be unrelated to the worker trait factors from The Dictionary of Occupational Titles and were, therefore, viewed as being limiting by the respondents.

Recommended Changes

An update of the system's norms and revision of some of the work samples to be more reflective of the present job market was recommended.

Figure 13
Satisfaction with System Constructs: VITAS



SUMMARY OF SURVEY RESPONSES - SOFTWARE

CAPCO
Users Ratings and Comments

Strengths

"Current" is the word that was used to describe the strengths of the CAPCO System. User friendliness, availability of wage rates on a nation-wide basis, and comprehensiveness were common themes. Although not frequently referenced, but worthy of comment, is that the program has a low initial cost when compared to other systems.

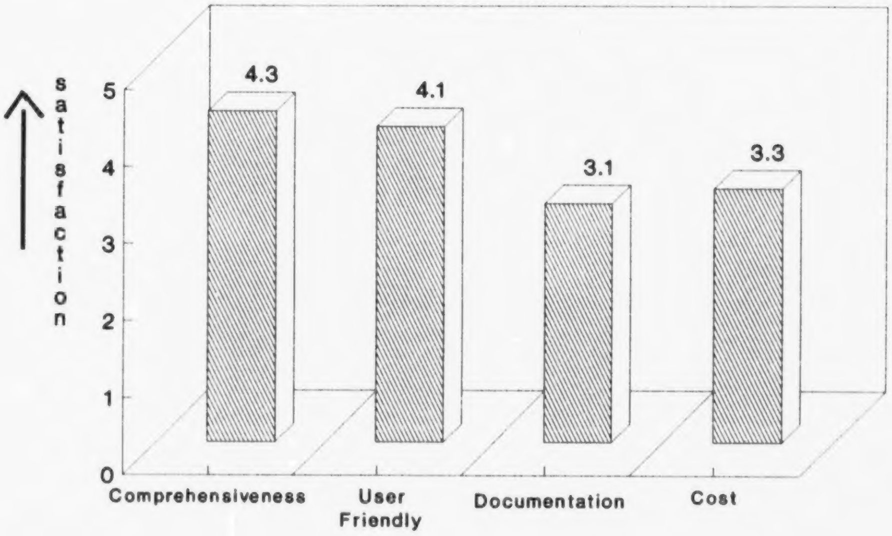
Weaknesses

The on-line costs of the CAPCO System were viewed as a weakness. Sophisticated users, it was noted, were able to cut down their cost associated with on-line time. The lack of flexibility in the type of print selection or customization of reports generated from accessing the CAPCO System were referenced as weaknesses.

Recommended Changes

Improved flexibility to allow for more customized reports and mechanisms by which the technology of a modem could be used were two common themes. On-line interruptions caused by acts of nature (storms, power outages, etc.) resulted in work being lost or difficult to be retrieved.

Figure 14
Satisfaction with Software Constructs: CAPCO



JOBS II
User Ratings and Comments

Strengths

The flexibility of the use of the program was referenced most frequently by respondents as to the strengths of the JOBS II program, followed by the comprehensiveness of the program. In addition, several comments were made indicating ease of use due to the menu-driven nature of the program. Users found the system to be easily utilized with a variety of different types of tests. The card reader/scanner test scoring device was identified as a strength of the system.

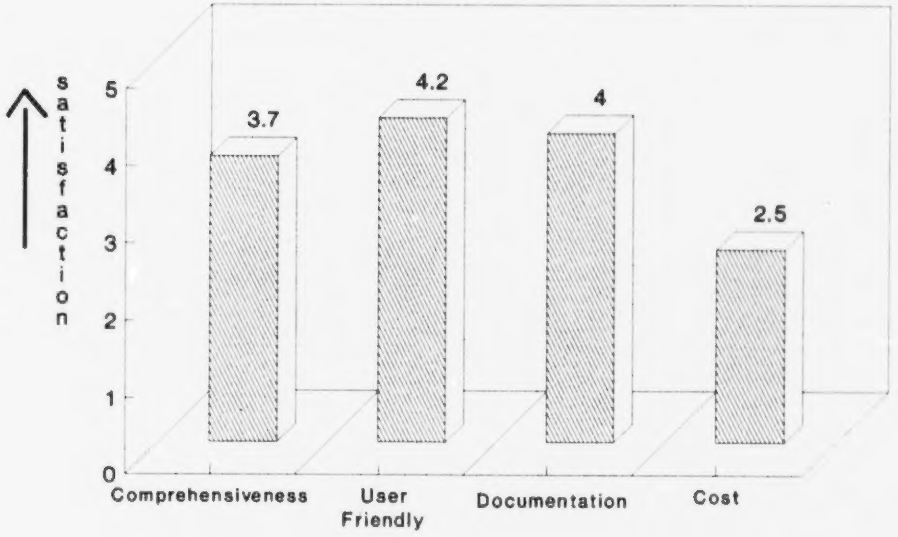
Weaknesses

Users reported experiencing difficulty learning or understanding all aspects of the program. Sometimes the Help screens were viewed as being not very helpful, and the manual was not as helpful as it might have been for troubleshooting.

Recommended Changes

More extensive Help menus and revision of the manual were the changes most frequently recommended.

Figure 15
Satisfaction with Software Constructs: JOBS II



Labor Market Access (Plus)/Quest

User Ratings and Comments

Strengths

Accessibility to a variety of labor market statistics was identified as a strength of the LMA program. The speed of the searches and the availability of preinjury and postinjury percentages of work were referenced as highly desirable.

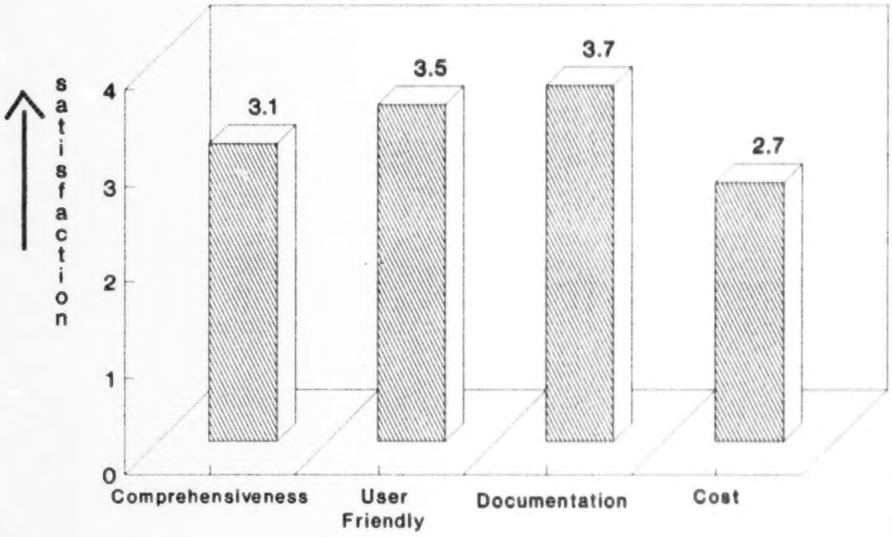
Weaknesses

Lack of flexibility with respect to the types of searches which are within the capacity of the program to be run was referenced as a weakness. The program is limited to, according to the users, very specific uses. Report options are limited. Questions were raised regarding the databases used, particularly related to salaries associated with particular jobs or clusters of jobs. The program, according to comments, does not have the capacity for the types of transferability of skills analyses and other types of searches found on other job search software.

Recommended Changes

The two areas recommended for change pertain to the reports that are generated and the "attractiveness" of the screens. Suggestions included adding greater flexibility of the content and general appearance of the reports. In addition, the screens could make better use of color and perhaps utilize windows..

Figure 16
Satisfaction with Software Constructs: LMA



OASYS

Users Ratings and Comments

Strengths

Accessibility, comprehensiveness, and customer service were the three strengths identified. The respondents thought the program was easy to use and represented a comprehensive databank and one that was up-to-date as much as possible with PC versions. The manual was referenced as a strength to the system.

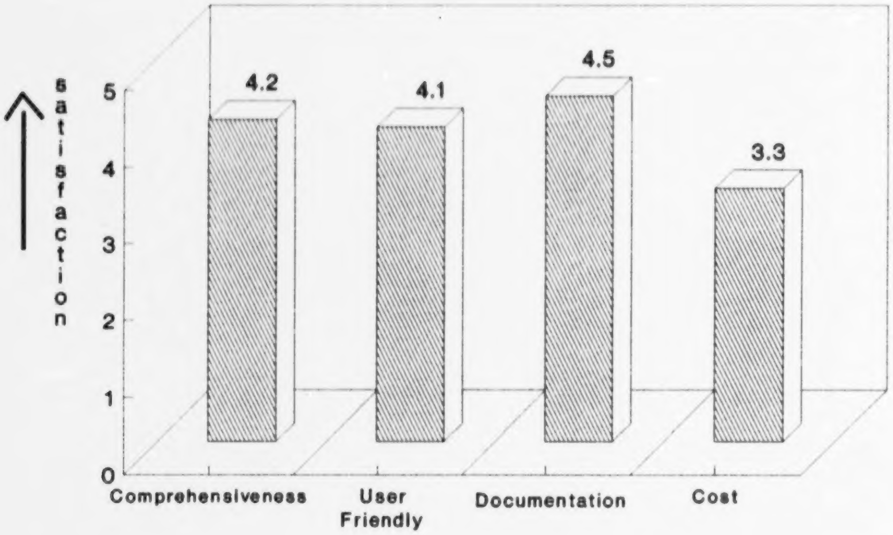
Weaknesses

The time required to conduct searches was referenced as a weakness. This did not seem to be related to the search speed but rather the time required to input the variables and get a search conducted. The other weaknesses related to flaws in the Department of Labor databases.

Recommended Changes

Most of the recommended changes were related to the printouts. Respondents were interested in the program being exportable to their own word processing package; several comments were made that they would like the program to be windows–compatible. There were diverging comments about the screens. Some felt the screens could be less complicated and also more colorful while others referenced the color and makeup of the screens as assets.

Figure 17
Satisfaction with Software Constructs: OASYS



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RAVE
User Ratings and Comments

Strengths

The RAVE was viewed as being user-friendly and easily learned. It was also noted that the program was quick to access and exit. The report formats generated by the RAVE were valued.

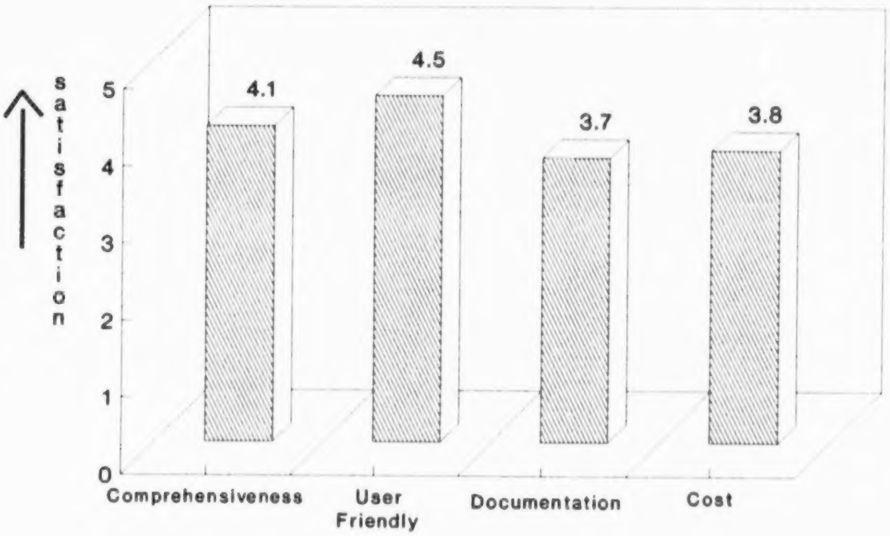
Weaknesses

The three themes included 1) some of the averaging effects of the data, 2) the manual Save feature, and 3) the lack of flexibility of the program to allow for entry by occupational title, rather than DOT number.

Recommended Changes

Some of the users thought the program would be of greater utility if the search methods currently existing with RAVE were expanded to include those methods employed by other search programs.

Figure 18
Satisfaction with Software Constructs: RAVE



SYSTEM 2000/MESA (Software)

User Ratings and Comments

Strengths

Ease of use and flexibility with the types of searches were frequently referenced. The size of the database and the ability to manipulate the data prior to printing were seen as assets to the program.

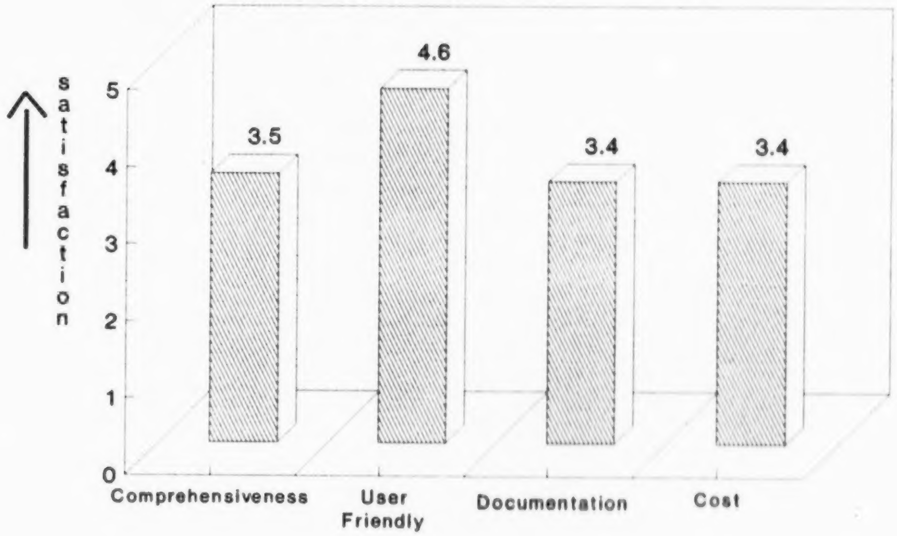
Weaknesses

The instruction manual was referenced as being not very helpful and a few related comments indicated some confusion. The interest inventory was referenced as a weakness.

Recommended Changes

Increasing the flexibility of the available report options and revising the manual to make the system more user friendly were some of the recommendations for change.

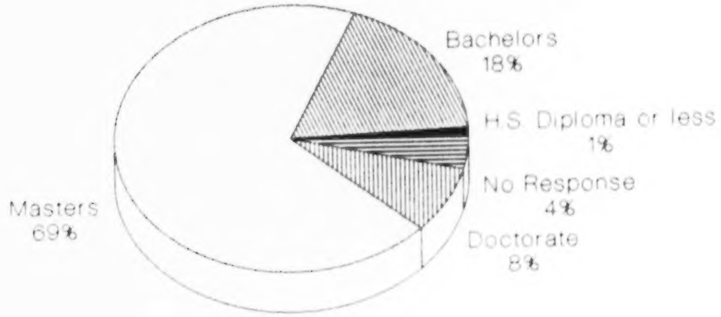
Figure 19
Satisfaction with Software Constructs: System 2000



Discussion

The respondents to this survey represent an elite class of vocational evaluation practitioners. Sixty-nine percent of those responding to the survey reported having master's degrees and eight percent had achieved a doctorate. Eighteen of the remaining 23% reported having bachelors' degrees, leaving 2% who had not minimally achieved a four-year diploma. Figure 20 summarizes the educational background of the respondents.

Figure 20
Educational Background (N=298)



Seventy-eight percent of the respondents' terminal degrees were in rehabilitation or directly related. Certified Vocational Evaluators represented 57% of the sample members, 29% were Certified Rehabilitation Counselors, and 15% were otherwise certified (i.e., LPC, LRC, CIRS, etc.); some respondents had more than one certification. The average experience as a vocational evaluator was 9.6 years.

The make-up of the sample responding to the surveys requires attention when attempting to generalize the findings of this study. In addition to representing a well-educated and experienced group, the population from which the sample was taken consists exclusively of members of the national Vocational Evaluation and Work Adjustment Association (VEWAA). By virtue of membership in the professional association some hypotheses or assumptions can be made that address the competence level of the group as a whole which may not generalize to all vocational evaluators. The setting in which respondents practice might also vary according to group membership. Forty-six percent (46%) of those participating in this study were employed by state vocational rehabilitation or private nonprofit organizations, and a substantial percentage of the remaining subjects were similarly employed in settings that provide services to vocational rehabilitation clients. There are other groups of professionals from different employment settings who conduct vocational evaluations not significantly represented in the VEWAA membership. Examples include those employed with U.S. Employment Services, Job Training Partnership Act (JTPA), school systems, Disability Determination and the personnel industry.

A significant limitation to this study is that even though the overall response rate to the survey was adequate (54%, N=298), the per product frequency of responses were in many cases few and the rate of responses highly variable. A point which warrants consideration is that the thirteen products (seven evaluation systems and six software programs), presented in the preceding comparative format, are ones which likely represent a higher level of quality than many others found in the marketplace. Ratings on all of these products across all of the constructs were in the positive range, with exceptions arising only from those domains in which the products do not claim to assess.

The analysis of the responses to the software surveys demonstrated an association between the level of satisfaction and years of experience. There was no statistically significant relationship, however, between the users' of vocational evaluation systems level of reported satisfaction and years of experience. One plausible explanation for the association existing in the case of the software users and not the system users is the relative differences of the sophistication of these two types of products. Vocational job search software is a more recent addition to the practice of vocational evaluation than the commercial vocational evaluation systems, and arguably requires a greater familiarity with the subtleties of vocational evaluation. Systems have existed sufficiently long enough to have successfully evolved to the present status of being more "user friendly" than job search software. Software programs, when compared to vocational evaluation systems, have evolved at an exponential rate but presently require a more thorough working knowledge of the principles of vocational evaluation. When added to the competency requirement that the evaluator have a working understanding of the use of computers, the disparity between the extent of evolution between systems and software becomes apparent.

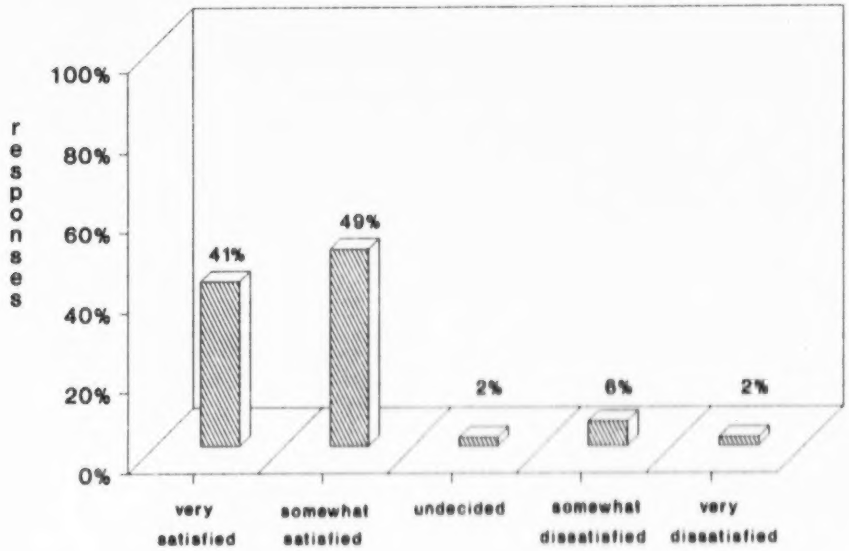
User responses to the software and systems surveys as separate groups indicated that there exists an association between level of satisfaction and who purchased the product. Persons who were responsible for the purchase of a product reported statistically higher levels of satisfaction. Plausible explanations for this association are both obvious and subtle. There is a greater acceptance of the responsibility, or consequences, for one's own decisions. This phenomenon, commonly referred to as cognitive dissonance, is one which has been given considerable attention in rehabilitation. Recent legislation, particularly The Amendments to the Rehabilitation Act of 1973 and The Americans with Disabilities Act, suggest that empowerment is directly related to ownership, which arises from involvement in the decision-making process. The findings of the present study would be consistent with this principle.

Ownership in the decision-making process is one factor which could influence the satisfaction with a product. Another consideration relates to the visionary differences between the one who purchased the product and the one who must then use it. When going about the process of researching these products, the data obtained regarding the capabilities of the product serve to define the vision as to how the tool will be used. If the user is not involved in the process, then part of the vision might be lost when the product is integrated into service delivery. It may also be true that the satisfaction with a product is justifiably lower when the party making the decision to purchase the product is not the same one who is going to use it. This could be the case when the decision-maker lacks the requisite background or knowledge to adequately assess the fit between the capabilities of the product and the needs of the organization.

A consideration when addressing the limitations of this study pertains to adequate identification of the product being considered. Product development is, by design, a constantly evolving process, and the ability to discern among different versions of the same product is poor at best and in many cases nonexistent. Unquestionably, data presented reflect information obtained from evaluators' rating different versions of the same product. This effect is most likely to impact on the constantly evolving software market.

One result of conducting a study of this nature is that a finding might indicate that the instruments being used in the field were viewed by the professionals as being wholly inadequate. This is certainly not the case. A perusal of Figure 21 provides conclusive data that the overwhelming majority (90%) of the respondents found their systems and software to be either very satisfactory or at least somewhat satisfactory. Only 2% were very dissatisfied. This would suggest that even though the panacea for assessment may not yet have been developed, the tools are believed by the users to be adequate.

Figure 21. Overall Satisfaction: Software and Systems



IV

Assessing Systems and Software

Assessing Systems and Software

Those purchasing evaluation/assessment systems and software must first consider the scope and purpose of their particular assessment program: 1) What is the primary disability (disabilities) of those being evaluated; 2) Where is the physical setting(s) of the evaluation practice; 3) What is the type of practice (students in schools, workers in business and industry, clients of rehabilitation centers, mobile units, or private rehabilitation practices); 4) How much time is available for assessment/evaluation; and 5) What are the available financial resources?

The answers to these questions will impact significantly upon decisions regarding the selection of products appropriate for each consumer's need. Those novice consumers who are considering investment in an assessment product should, in addition to reviewing this book, also consult with knowledgeable peers about appropriate choices to meet specific individual program needs.

Section III of this book features the results of a consumer survey of vocational evaluation/ assessment systems and software. This consumer study, conducted by Michael C. McClanahan, was done independently of the reviews relating to systems and software. Consumer opinions may or may not agree with those expressed by the authors. However, the consumer survey results provide additional information from practicing rehabilitation professionals in the field that can further enhance the consumer's knowledge of available tools. At the 1993 VEWAA Forum,[1] Mr. McClanahan also posed the following 20 questions which consumer's may want to ask when negotiating with developers about individual systems:

1. What was the theoretical construct driving the development of this instrument?
2. Tell me about the reliability and validity studies? Have any of these been published in refereed professional journals?
3. What norm groups were used in the standardization of the instrument?
4. Are there disability specific accommodations?
5. Is this an individual or group administered instrument?
6. How much time is required in administering and scoring each component?
7. What are the scoring procedures?
8. What professional credentials are required to administer, score, and interpret results?
9. What training is required, where is this available, and what are the costs?
10. How often is the system updated? What is the cost of updating?
11. In what way will refinements or new developments of the database (e.g., Dictionary of Occupational Titles) effect the validity of the instrument? How do you intend to handle such changes? What arrangements are going to be made with recent purchasers?

---

[1] See McDaniel, R., & McClanahan, M. (1993). Selecting vocational evaluation tools. In R. Fry & W. Garner (Eds.), The Issues Papers. The Sixth National Forum on Issues in Vocational Assessment. Menomonie, WI: University of Wisconsin-Stout, Materials Development Center.

12. What is the total cost including software, hardware, training, expendables, scoring, etc.?

13. How does the cost of your product compare with your competitors? Why do your prices differ?

14. What expendables are involved? What do they cost? Can I buy them from someone other than you? Can these legally be copied?

15. What is the warranty? Can I return the product if I am not satisfied?

16. What are the most frequent complaints?

17. Will you give me the name and address of 10 satisfied customers?

18. What is your service policy? How long will it take to make needed adjustments or repairs?

19. Will the company stand behind statements made by sales representatives?

20. Will you put your answers to these questions in writing?

Professional rehabilitation consumers, involved in the evaluation process with those with disabilities, are entitled to the best available technology. The 20 questions posed by McClanahan should provide rehabilitation professionals a framework necessary to make informed decisions relating to commercially available evaluation systems and software. Such scrutiny by those contemplating the purchase of available products should serve notice to developers that informed consumers expect and deserve evidence of the product's utility. This expectation will encourage developers in continuing refinement and improvement of their products.

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Appendix

Glossary

Alternate Forms: Two or more forms of the same assessment instrument

Aptitudes: A combination of abilities and other characteristics, whether native or acquired, that are indicative of an individual's ability to learn or develop proficiency in some particular area if appropriate education or training is provided. (Mitchell, n.d., in VEWAA Glossary, 1993).

The following aptitudes can be measured:

> **G** - Intelligence - General learning ability. The ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgements. (U.S. Department of Labor, 1970).
>
> **V** - Verbal Aptitude - The ability to understand meaning of words and use them effectively. The ability to comprehend language, to understand relationships between words and to understand meanings of whole sentences and paragraphs. (U.S. Department of Labor, 1970).
>
> **N** - Numerical Aptitude - Ability to perform arithmetic operations quickly and accurately. (U.S. Department of labor, 1970).
>
> **S** - Spatial Aptitude - Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. (U.S. Department of Labor, 1970).
>
> **P** - Form Perception - Ability to perceive pertinent detail in objects or in pictorial or graphic material. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines. (U.S. Department of Labor, 1970).
>
> **Q** - Clerical Perception - Ability to perceive pertinent detail in verbal or tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation. (U.S. Department of Labor, 1970).
>
> **K** - Motor Coordination - Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. (U.S. Department of Labor, 1970).
>
> **F** - Finger Dexterity - Ability to move the fingers and manipulate small objects with the fingers rapidly or accurately. (U.S. Department of Labor, 1970).
>
> **M** - Manual Dexterity - Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions. (U.S. Department of Labor, 1970).

Criterion-referenced (Content-referenced) Testing: Terms often used to describe tests designed to provide information on the specific knowledge or skills possessed by an individual. (Mitchell, n.d., in VEWAA Glossary, 1993).

Developmental Disability: A severe, chronic disability of a persons [sic] which--

1) Is attributable to a mental or physical impairment or combination of mental and physical impairments;
2) Is manifested before the person attains age twenty-two;

3) Is likely to continue indefinitely;
4) Results in substantial functional limitations in three or more of the following areas of major life activity:
    (i) self-care,
    (ii) receptive and expressive language,
    (iii) learning,
    (iv) mobility,
    (v) self-direction
    (vi) capacity for independent living, and
    (vii) economic self-sufficiency, and
5) Reflects the person's need for a combination and sequence of special, interdisciplinary, or generic care, treatment, or other services which are of lifelong or extended duration and are individually planned and coordinated.

(The Developmental Disabilities Assistance and Bill of Rights Act, 1990, in VEWAA Glossary, 1993).

Dictionary of Occupational Titles (DOT): "...provides the user with a variety of explanatory information and techniques for accessing and understanding the technical data on occupations. Occupational definitions are arranged according to the nine-digit occupational codes, and an alphabetical index is included, as well as an arrangement of occupational titles and codes by industry designation. Occupational information, therefore, can easily be accessed by those who want a description of the tasks performed in a particular occupation. ...Since the DOT organizes 12,099 occupations into groups homogeneous on the basis of "work performed," it can be used to develop an understanding of occupational relationships and possibilities for job progresssion. It is widely used in counseling and is of critical importance in matching the occupational qualifications of experienced workers and the requirements of job openings." (Bolton, 1987, pp. 176-77).

Environmental (Working) Conditions: The physical surroundings of the job that make specific demands on a worker's physical capacity. (Botterbusch, 1984, in VEWAA Glossary, 1993).

Guide for Occupational Exploration (GOE): "...designed to provide a trait-oriented structure of DOT-defined occupations suitable for relating an individual's characteristics to occupational groupings. ...[it] 1) relates aptitude and interest test scores to GOE Interest Areas and Work Groups and 2) provides for occupational exploration using the GOE Work Group and Interest Area information about specific occupations." (Bolton, 1987, pp. 177-8).

Handbook for Analyzing Jobs: "...is devoted to an explanation of the procedures and techniques used in the public employment service to analyze jobs and record the analyses. These procedures and techniques were developed to meet the occupational information needs of various human resource programs, and are applicable to any job analysis program, regardless of the intended utilization of the data." (The Revised Handbook for Analyzing Jobs, 1991, p. 1-1).

Internal Consistency: "...the criterion is none other than the total score on the test itself." (Anastasi, 1988, p. 155).

Mean(s), Arithmetic: A kind of average usually referred to as the mean. It is obtained by dividing the sum of a set of scores by their number. (Mitchell, n.d., in VEWAA Glossary, 1993).

Methods-Time Measurement (MTM): A procedure which analyzes any manual operation or method into the basic motions required to perform it and assigns to each motion a predetermined time standard which is determined by the nature of the motion and the conditions under which it was made. (Maynard, Stegmerten, & Schwab, 1948, in VEWAA Glossary, 1993).

Mobile Evaluation Unit: A self-contained vocational evaluation unit usually containing work samples and other standardized assessment instruments. Such units are useful in conducting evaluations in school settings.

Modular Arrangement of Predetermined Time Standards (MODAPTS): A predetermined time system (a system which enables a standard time for any task to be established once the elemental motions are identified) that relates standard time for movement to parts of the human body. It defines and measures two groups of activities: the movement of the human limb through space and the activity performed at completion of the movement, called the terminal activity. (McLeod, 1972, in VEWAA Glossary, 1993).

Norm Referenced: "This approach to test interpretation locates the examinee in comparison to a large representative sample of persons. The sample of persons is representative of a carefully defined normative population and the compilation of test scores for the comparison sample is called test norms. Norm tables are, then, simple statistical devices for converting raw scores into scores with comparative meaning, called derived scores. ...The important point to emphasize about norm-referenced scores is that they are predicated on the identification of a relevant normative population. ...Because there may be several relevant populations for interpretive purposes, many instruments have several normative samples tabled." (Bolton, 1987, p. 9).

Norms: Statistics that supply a frame of reference by which meaning may be given to obtained test scores. (Mitchell, n.d., in VEWAA Glossary, 1993).

Occupational Aptitude Patterns: "...are combinations of GATB [General Aptitude Test Battery] aptitudes with associated cutting scores. OAPs indicate the aptitude requirements for groups of occupations. There are 66 OAPs in the current edition, and they cover 97% of the nonsupervisory occupations in the fourt edition of the Dictionary of Occupational Ttiles (U.S. Department of labor, 1977, 1982f). These OAPs relate directly to the well-defined and meaningful Work Groups in the Guide for Occupational Exploration (Harrington & O'Shea, 1984; U.S. Department of Labor, 1979a)." (Bolton, 1987, p. 173).

Pearson r (Pearson Product-Moment Correlation Coefficient): "This correlation coefficient takes into account not only the person's position in the group, but also the amount of his deviation above or below the group mean." (Anastasi, 1988, p. 112).

Percentile Score: "...derived scores, expressed in terms of percentage of persons. ...A percentile indicates the individual's relative position in the standardization sample." (Anastasi, 1988, p. 82).

Physical Capacity(s): The degree of physical strength, mobility, and endurance needed by a person to perform the physical demands of a specific job or a cluster of related jobs. (Fry & Botterbusch, 1988, in VEWAA Glossary, 1993).

Predetermined Time Standards: A system which enables a standard time for any task to be established once the elemental motions are identified. (McLeod, 1972, in VEWAA Glossary, 1993).

Raw Score(s): The first quantitative result obtained in scoring a test. It is usually the number of right answers; time required for performance; number of errors; or another similar direct, unconverted, uninterpreted measure. (Mitchell, n.d., in VEWAA Glossary, 1993).

Reliability Coefficient: A statistical measure used to determine the amount or degree a particular group's score varies from test to retest. Coefficients range from numerical values of 0 to 1.00. The nearer to 1.00 the more reliable the instrument.

Reliability: The extent to which a test is consistent in measuring whatever it does measure: dependability, stability, trustworthiness; relative freedom from errors of measurement. (Mitchell, n.d., in VEWAA Glossary, 1993).

Specific Vocational Preparation (SVP): "...a compontent of Worker Characteristics, [SVP] is defined as the amount of lapsed time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average performance in a specific job-worker situation. Lapsed time is not the same as work time. For example, 30 days is approximately 1 month of lapsed time and not six 5-day work weeks, and 3 months refers to 3 calendar months and not 90 work days." (The Revised Handbook for Analyzing Jobs, 1991, p. 8-1).

Standard Deviation: A measure of the variability or dispersion of a distrubiton of scores. The more the scores cluster around the mean, the smaller the standard deviation. For a normal distribution, approximately two thirds (68.3%) of the scores are within the range from one standard deviation below the mean to one standard deviation above the mean. (Mitchell, n.d., in VEWAA Glossary, 1993).

Standard Error of Measurement: "...the standard deviation of the distribution of errors of measurement." (Bolton, 1987, p. 23).

Standard Score(s): A general term referring to any of a variety of "transformed" scores, in terms of which raw scores may be expressed for reasons of convenience, comparability, and ease of interpretation. (Mitchell, n.d., in VEWAA Glossary, 1993).

Test-Retest Reliability: "...method for finding the reliability of test scores [is]...by repeating the identical test on a second occasion." (Anastasi, 1988, p.116).

Time and Error Scores: Scores based on a combination of time to complete the test and the number of errors made. These are then usually compared to an appropriate norm group.

Validity: The extent to which a test does the job for which it is used. (Mitchell, n.d., in VEWAA Glossary, 1993).

Validity Coefficient: The correlation between a test score and a criterion measure and is expressed by a number, such .51, .20, etc. (Power, 1991).

Validity, Concurrent: "...when both the predictor and criterion scores are obtained at the same time; we are interested in the relationship between present status on the test and present status on the criterion. The observed relationship between scores on scales of the Minnesota Multiphasic Personality Inventory and present psychiatric status would be concurrent validity data. Similarly, correlations between ability test scores and present performance in school or on the job are examples of concurrent validity coefficients." (Bolton, 1987, p. 43).

Validity, Construct: "...the extent to which the test may be said to measure a theoretical construct or trait." (Anastasi, 1988, p. 153).

Validity, Content: "...involves essentially the systematic examination of the test content to determine whether it covers a representative sample of the behavior domain to be measured." (Anastasi, 1988, p. 140)

Validity, Predictive: This type of validity refers to the relationship between an individual's performance on a test and some predetermined criterion. It is usually established by administering the instrument to a group, placing them in some type of program, and then gathering data on the outcome. A relationship is then computed between the test and the program outcome.

Worker Function Levels (DPT): "The ways in which a job requires the worker to function in relation to Data, People, and Things, as expressed by mental, interpersonal, and physical worker actions. Every job is assigned the three Worker Functions that best characterize the worker's primary involvement with Data, People, and Things, and the predominance of each function is indicated. These estimates provide useful information about the Work Performed." (The Revised Handbook for Analyzing Jobs, 1991 p. 2-2).

Worker Qualification Profile (WQP): The WQP refers to the level of physical demands, aptitudes, general educational development, wokring conditions, interests, and temperaments an individual has displayed through previous jobs, analysis of test data, or a combination of both.

Worker Trait Group (WTG): A classification of occupations based on similar worker traits, especially the Data, People, and Things ratings. (Fry & Botterbusch, 1988, in VEWAA Glossary, 1993).

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